

**THE RELATIONSHIP BETWEEN TRAUMA AND SUBSTANCE MISUSE IN
HIGH-RISK MENTALLY DISORDERED OFFENDERS**

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ABSTRACT

This thesis aims to provide an original contribution to knowledge regarding the relationship between trauma and substance misuse in high-risk mentally disordered offenders (MDOs), and to determine if gender differences exist, in order to inform interventions. This was accomplished through ascertaining the prevalence of past trauma and past severity of substance misuse, and its relationship to current trauma-related distress in male and female MDOs, and subsequently undertaking a more detailed exploration with women to ascertain their views on the relationship.

Chapter 1 introduces the context of the study, exploring relevant research regarding substance misuse treatment and the connection between mental disorder, substance misuse, and trauma, and the significance of gender plus the implications for effective interventions.

Chapter 2 presents a systematic review investigating gender differences in substance-using convicted offenders to discern specific factors to facilitate gender-informed treatment. Due to the studies' heterogeneity, a narrative synthesis was undertaken. Gender differences were found in seven areas including demographics, physical health, mental disorder, past trauma, substance use, offending, and treatment. In general, females were found to be younger, with greater social disadvantage concerning education, employment, income, and physical and mental health. Females also reported more historic trauma exposures, alongside higher rates of substance misuse. Men typically had more arrests, convictions, and longer imprisonments whilst women had received more treatment and therapy-related gains.

Chapter 3 provides a psychometric test critique of the Trauma Symptom Inventory-2 (TSI-2). The TSI-2 was utilised in the quantitative research to assess levels of current trauma-related distress, as described in Chapter 4.

Chapters 4 and 5 present a mixed methods research project conducted with MDOs detained in one high security hospital. Chapter 4 focusses on the quantitative study, aimed at determining the prevalence of past trauma and substance misuse, and their relationship to current trauma-related psychological sequelae and establishing if there are variations by gender. The 58 participants had experienced a minimum of two past traumas and an average of seven, ascertained via the Life Events Checklist for DSM-5 (LEC-5). Almost all (86.21%) had misused substances historically, determined through the Drug Abuse Screening Test (DAST-20), the Alcohol Use Disorder Identification Test (AUDIT), and a substance use severity score calculated from the DAST-20 and AUDIT results to reflect the level of past substance misuse. Current trauma-related symptomatology was gauged with the TSI-2. It was found participants had an average of three clinically elevated areas of trauma-related symptomatology; there were no gender differences. The findings indicated LEC-5 scores were unrelated to TSI-2 scores. Higher substance use severity scores were associated with higher levels of current Self-Disturbance, Posttraumatic Stress, Anxious Arousal, and Anxiety. No gender differences were discovered regarding past trauma levels, substance misuse history, or current trauma-related distress. Greater past substance use severity was associated with higher levels of current trauma-related psychological sequelae for men but not women.

Chapter 5 presents the qualitative study, which explored with a female subset ($n=23$) their perceptions about the relationship between their past substance misuse and trauma exposure. Thematic analysis of interviews identified three superordinate themes: substance misuse as a coping strategy, substance misuse linked to increased

trauma/risk exposure, and coercion to misuse substances as instrumental to the trauma.

Chapter 6 provides an overall discussion of the work, implications for clinical practice, and future research recommendations.

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DEDICATION

I dedicate this thesis to Patricia G. Erickson, PhD, Professor of Sociology and Criminology, University of Toronto, and Scientist Emerita, Centre for Addiction and Mental Health. My interest and passion in the area of offending, and especially substance misuse started when I was a student of Professor Erickson's many years ago. Professor Erickson has been a longstanding, hugely influential, and consistently supportive person in my life.

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LIST OF ABBREVIATIONS

ACE:	adverse childhood experience
ANOVA:	analysis of variance
ASPD:	antisocial personality disorder
AUD:	alcohol use disorder
AUDIT:	Alcohol Use Disorder Identification Test
BMI:	brief motivational interviewing
BPD:	borderline personality disorder
CBM:	Collaborative Behavioural Management
CFI:	comparative fit index
CJ-CEST:	Criminal Justice Client Evaluation of Self and Treatment
CNS:	central nervous system
CFA:	confirmatory factor analysis
CT:	criminal thinking
CTL:	control information-advice intervention
DAST-20:	Drug Abuse Screening Test
DUI:	driving under the influence
DWI:	driving while impaired
GAD:	generalised anxiety disorder
HCPC:	Health and Care Professions Council
HMO:	Health Maintenance Organisation
IDU:	injecting drug use
IES-R:	Impact of Event Scale-Revised
JBİ:	Joanna Briggs Institute
JBİ-MAStARI:	Meta Analysis of Statistics Assessment and Review Instrument
LEC-5:	Life Events Checklist for DSM-5
LCSP:	Lovelace Comprehensive Screening Program

MANOVA:	multivariate analysis of variance
MDUIL:	Middlesex DUI of Liquor (MDUIL) programme
MHA:	Mental Health Act
MDO:	mentally disordered offender
NHS:	National Health Service
NSW:	New South Wales
OST:	opiate substitution treatment
PAI:	Personality Assessment Inventory
PCL-C:	PTSD Checklist-Civilian
PICO:	population, issue, comparators, outcome
PRISMA:	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PTSD:	posttraumatic stress disorder
RC:	Responsible Clinician
RCT:	randomised controlled trial
RTA:	road traffic accident
<i>SD</i> :	standard deviation
TSC-40:	Trauma Symptom Checklist-40
TSI:	Trauma Symptom Inventory
TSI-2:	Trauma Symptom Inventory-2
UK:	United Kingdom
US:	United States

CHAPTER 1

INTRODUCTION

Historically the primary focus in the substance misuse literature has been on men, with treatment developed as a single-focussed intervention established on the needs of dependent males (Covington, 2008; Holloway & Bennett, 2007). Women's under-representation in treatment groups and research studies has led to the recognition that the effects of substance misuse, and treatment needs are less understood for women than for men (Bride, 2001). This, along with a corresponding relative rise in the number of women in the criminal justice system due to drug-related crime, has resulted in an increasing emphasis placed on the development of gender-specific treatment programmes for women (Bride, 2001; Pelissier & Jones, 2005; Sacks, 2004; Saxena, Grella, & Messina, 2016).

Substance misuse treatment for women will be ineffective unless it focusses on women's experiences (Covington, 2008). The growing importance placed on the development of gender-specific treatment programmes directed at women's unique needs regarding substance misuse intervention has unearthed several gender differences (Zilberman, Tavares, Blume, & el-Guebaly, 2002). These comprise the physiological effects of substances, medical consequences, psychiatric comorbidity, craving patterns, and family and developmental issues involving the high prevalence of violence and other kinds of abuse (Covington, 2008; Long, Fulton, Fitzgerald, & Hollin, 2010; Pelissier & Jones, 2005; Zilberman et al., 2002).

For women, there is an established evidence base suggesting that substance misuse is correlated with a history of trauma exposure, particularly during childhood (Byrne & Howells, 2002; Hien, Litt, Cohen, Miele, & Campbell, 2009; Khoury, Tang, Bradley, Cubells, & Ressler, 2010; Logan, Walker, Cole, & Leukefeld, 2002; Tucci, Kerr-Corrêa, &

Souza-Formigoni, 2010). Trauma exposure prevalence rates for women vis-à-vis men are higher, especially physical and/or sexual abuse, which is linked to substance misuse; as a consequence this potentiates mental disorder, which increases women's criminality risk (Gunter, Chibnall, Antoniak, McCormick, & Black, 2012; Long, Fulton, & Hollin, 2008; Saxena et al., 2016). Correspondingly, it has emerged in recent decades that attending to trauma is considered an essential component of substance misuse treatment for women (Covington, 2008; Zilberman et al., 2002).

Moreover, research data reliably show that the co-occurrence of trauma and mental disorder is "the rule rather than the exception" (Hien et al., 2009, p.38) with mental disorder linked as the direct or indirect consequence of traumatisation (Aakre, Brown, Benson, Drapalski, & Gearon, 2014; Courtois, 2004; McGovern et al., 2009). While men and women are both negatively affected by childhood trauma exposure or ACEs (adverse childhood experiences), the association between trauma and the risk of developing psychiatric disorders (Simpson & Miller, 2002; Sinha & Rounsaville, 2002; Thompson, Kingree, & Desai, 2004) and substance use problems (MacMillan et al., 2001; Tucci et al., 2010) appears stronger in women. These links can act as precursors to criminogenic risks, furthering women's involvement in criminal activities (Hollin & Palmer, 2006; Saxena et al., 2016).

In view of the links between trauma and poor mental health, and between trauma and substance use, it is not surprising that a higher prevalence of psychiatric comorbidity is common in persons using substances; depression, anxiety, and antisocial personality disorder (ASPD) are the most frequently occurring mental disorders reported in general and prison populations (Goldstein, 2009; Light, Grant, & Hopkins, 2013; Pelissier & Jones, 2005; Sacks, 2004). Again, gender seemingly has an influence: generally, women with substance misuse issues have more psychological disorders overall than their male counterparts. Specifically, prevalence rates for depression and anxiety are

higher in women with substance-related problems than men irrespective of whether the conditions are assessed separately or combined, or with offenders; however, men are more likely than women to meet the criteria for a diagnosis of ASPD (Benishek, Bieschke, Stöffelmayr, Mavis, & Humphreys, 1992; Brady & Hartwell, 2009; Drapalski, Youman, Stuewig, & Tangney, 2009; Hien, 2009; Light et al., 2013; Pettinati & Plebani, 2009; Rodríguez-Llera et al., 2006; Sacks, 2004).

It would appear, given the aforementioned findings, relationships exist between substance misuse, mental disorder, and trauma exposure, with this association stronger in women than men. A trauma history may thus heighten the risk of persons with substance misuse issues, particularly women, to psychiatric comorbidity, which accordingly further increases the risk for women's participation in crime (Saxena et al., 2016; Zlotnick et al., 2008b).

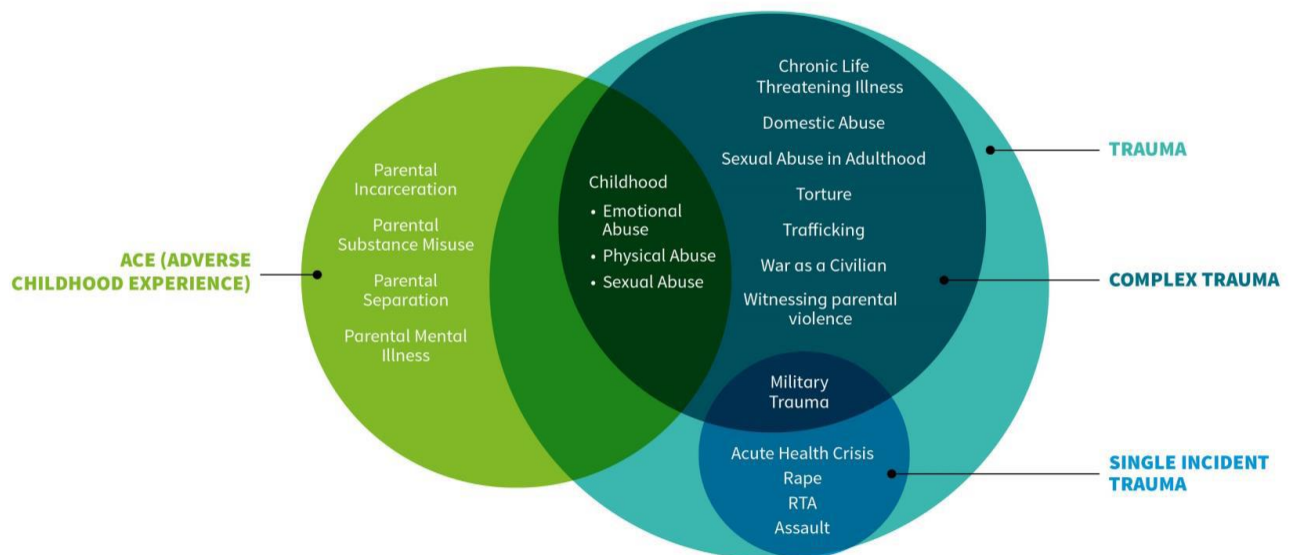
Although gender-responsive and trauma-informed substance misuse interventions responding to the distinct treatment needs of women are recommended and have demonstrated greater efficacy (Covington, 2008; Greenfield et al., 2007; Saxena et al., 2016; Zilberman et al., 2002), there is a lack of treatment interventions to address this complex pattern (Logan et al., 2002; Long et al., 2008; Long et al., 2010). Since comorbid substance use and mental disorder are common in women, and the prevalence of trauma exposure is high for women with mental disorder and substance use issues, it is essential to understand how trauma exposure affects women (Aakre et al., 2014).

Terminology

It is worthwhile at the outset to clarify key concepts utilised throughout this thesis; namely, trauma, substance misuse, and mental disorder. First, the notion of trauma is complex; hence an all-inclusive definition proves challenging. Until recently, trauma was generally understood as a psychological reaction to a single, circumscribed distressing event, routinely synonymised with posttraumatic stress disorder (PTSD) (Briere & Spinazzola, 2009). Within the thesis' sphere, a trauma response is conceptualised as a balance of demands and resource. It is a subjective experience, and so not everyone who experiences a distressing event will become traumatised; hence it is essential to consider the interface of several elements that may affect how the trauma is experienced.

Trauma results from an event, series of events, or set of circumstances in childhood and/or adulthood, which is experienced by an individual as physically or emotionally harmful or life-threatening, and surpasses the person's ability to cope; it has lasting adverse effects on the individual's functioning and mental, physical, social, emotional, or spiritual well-being (Substance Abuse and Mental Health Services Administration, 2014). To illustrate, trauma can result from interpersonal violence, road traffic accidents (RTAs), and exposure to adverse incidents. The potential scope of trauma is depicted in Figure 1 (NHS Education for Scotland, 2017).

Figure 1
The scope of trauma



Secondly, substance misuse refers to the harmful or hazardous use of central nervous system (CNS) psychoactive substances, which includes alcohol and illegal drugs that may or may not lead to dependency. Substance misuse, abuse, or problematic use are designates employed interchangeably in the thesis.

Finally, regarding mental disorder, the definition couched within the Mental Health Act (MHA) (1983 as amended 2007) is “any disorder or disability of mind” (Section 1(2)); hence, a mentally disordered offender is defined as a person suffering from a mental disorder and who has committed an offence and/or poses a risk to others. This operational definition is applied throughout the thesis to the specific group investigated i.e. patients within a high security hospital setting.

Mentally Disordered Offenders (MDOs)

Epidemiological links between substance misuse, mental disorder, trauma, and offending are well-established (Ardino, 2012; Gray et al., 2003; Kruppa, Hickey, & Hubbard, 1995; Pickard & Fazel, 2013) with high prevalence rates of substance misuse present in high-risk mentally disordered populations (Cappai et al., 2017; D'Silva & Ferriter, 2003; Morris & Moore, 2009). MDOs with substance misuse issues commit more seriously violent offences, have higher rates of offending, and following discharge, continued use is correlated with a greater level of violent recidivism (Thomas & Withers, 2010).

Nonetheless, it is recognised that treatment provision for comorbid substance misuse and mental disorder in forensic populations in the United Kingdom (UK) is inadequate with the impact of interventions not completely understood (Long et al., 2010; Morris & Moore, 2009). This is within the overall context of limited research relating to treatment programmes for this population, and a greater paucity of research concerning single-gender substance misuse treatment outcomes for women detained in secure settings (Long et al., 2008; Long et al., 2010; Morris & Moore, 2009).

Regarding women in high security, there have not been any studies which have comprehensively investigated the individual needs of these women in relation to their placement support.

Extant studies of forensic patients involve primarily male samples (e.g. Cappai et al., 2017), with substance misuse treatment programmes developed with, and for, a male gender population. Adaption of treatments for a female population is deemed to provide a 'gender-sensitive' or 'gender-responsive' intervention. However, modifications routinely adopt a 'one size fits all' approach ignoring the specificity of women's needs regarding past trauma and mental disorder (Salter & Breckenridge,

2014). With the dearth of research on substance misuse treatment for female MDOs, the substance misuse treatment curricula that should be emphasised for this cohort is unclear.

Pathways Regarding Trauma and Substance Use

As elucidated above, the importance of trauma exposure recurs in the literature. However, concerning comorbid substance misuse for women and its relationship to mental disorder, relatively little is known about fundamental relationships that may explain the comorbidity (Chilcoat & Breslau, 1998a). Several pathways between trauma and substance use have been hypothesised to demonstrate how they may be functionally interrelated (Jacobsen, Southwick, & Kosten, 2001; Stewart, Pihl, Conrod, & Dongier, 1998). These pathways are apparently multi-directional and complex, and gender plays an important role in these (Brady, 2001; Zlotnick et al., 2008b).

The hypothesis with the greatest support is Khantzian's (1997) self-medication model, which suggests an explanation for the initiation and maintenance of addiction (Chilcoat & Breslau, 1998b; Dworkin, Wanklyn, Stasiewicz, & Coffey, 2018; Hien, Cohen, & Campbell, 2005; Stewart et al., 1998). The general postulation is that trauma exposure is a risk factor for subsequent substance misuse; hence persons with trauma histories use substances to manage or avoid distressing symptoms, and to relieve painful emotions or physical sensations to re-establish homeostasis (Brady & Back, 2012; Gong, Kamboj, & Curran, 2019; Hien et al., 2005). Trauma-related symptoms rather than the traumatic event itself seem to have a functional relationship with substance misuse (Wiechelt, Miller, Smyth, & Maguin, 2011).

Chilcoat and Breslau (1998a, 1998b) investigated the temporal sequencing of PTSD and drug abuse/dependence in a large random sample ($N=1,007$) of 21- to 30-year-olds

from a South-Eastern Michigan Health Maintenance Organisation (HMO) using both prospective and survival analysis; hence they were able to develop findings from previous studies reliant on cross-sectional data. Their results provided credibility for the self-medication hypothesis to the detriment of other causal pathways. However, the generalisability of their findings may be limited given their sample was drawn from one area of one American state only, dominated by the metropolitan city of Detroit, and may have skewed analyses of socioeconomic status i.e. of higher standing given that a HMO provides services for a fee. Indeed, Chilcoat and Breslau (1998b) note their sample was under-represented with regards to extremes of socioeconomic distribution.

Few studies have investigated the role of the effects of specific substances in this self-medication process, seemingly deeming substance use a single entity (Chilcoat & Breslau, 1998a; Stewart et al., 1998; Wiechelt et al., 2011). The self-medication model suggests a degree of psychopharmacological specificity in that the individual's drug of choice is the result of an interaction between the psychopharmacologic action of the drug being expected to psychophysiologically alleviate the dominant painful feelings with which they struggle (Gong et al., 2019; Khantzian, 1985). Evidence tentatively suggests that different trauma-related symptoms are likely associated with different types of substances (Dworkin et al., 2018; Saladin, Brady, Dansky, & Kilpatrick, 1995; Stewart et al., 1998). For example, research has reported that individuals dependent on alcohol differ in their trauma symptomatology contrasted to individuals dependent on cocaine (Saladin et al., 1995). Yet closer scrutiny of Saladin et al.'s (1995) results reveals primarily non-significant findings with the only significant outcome related to alcohol dependence being more closely associated with hyperarousal symptoms. This is within the context of Saladin et al.'s (1995) study being plagued by a small sample size ($N=36$ [$n=19$ for alcohol, and $n=17$ for cocaine]).

More recent research by Wiechelt et al. (2011) demonstrated that although alcohol and cocaine misusers experienced more PTSD symptoms overall compared to other drugs, they did not differ from each other whilst initial analyses by Dworkin et al. (2018) suggested drug use disorder was linked to hyperarousal. However, this finding was directed by the relatively large proportion of the sample with cocaine use disorder, which evidenced a greater degree of hyperarousal symptomatology; hence although different substances are differentially associated with PTSD symptom clusters, collapsing them in studies exploring their relationship with PTSD symptoms could generate misleading findings or conceal differential relationships (Dworkin et al., 2018).

Persons with arousal-related symptoms (e.g. irritability, recklessness, or sleep disturbance) may be more likely to misuse CNS depressant drugs like opiates or alcohol because of their powerful muting action on the emotions of rage and aggression due to their arousal-dampening properties while persons experiencing less severe levels of arousal-related trauma symptomatology are likely to misuse drugs such as cocaine that have arousal-enhancing effects to relieve distress associated with depression, for example (Khantzian, 1985; Stewart et al., 1998). These results may as well suggest that alcohol vis-à-vis cocaine misuse exacerbates trauma-related symptoms (e.g. sleep disturbance) in the longer term, or that alcohol withdrawal could mimic arousal-related trauma symptoms (Saladin et al., 1995).

If comorbid persons are self-medicating trauma symptoms through substance use, substances should thus be a potentially effective means of managing trauma symptoms; nevertheless, alcohol, heroin, cannabis, and benzodiazepines have been reported to ameliorate trauma-related symptomatology whilst others substances, such as cocaine, have reportedly worsened or prolonged symptomatology (Stewart et al., 1998); this is possibly because they prevent habituation to the traumatic event or memories of it. These findings accord with other research unearthing a link between

trauma exposure and risk of substance misuse for specific drugs, which was greatest for prescribed CNS drugs inclusive of depressants such as benzodiazepines and opiates (Chilcoat & Breslau, 1998a).

The role of neurotransmitters may be a significant factor in the relationship between trauma and risk of using certain substances (Brady & Back, 2012). To illustrate, alcohol use, like traumatic events, increases endorphin activity; hence the 'endorphin compensation hypothesis' postulates people drink alcohol subsequent to traumatic events to offset the lack of endorphin activity that can be induced from the resultant endorphin withdrawal (Volpicelli, Balaraman, Hahn, Wallace, & Bux, 1999). Endorphin withdrawal plays a part in substance use to control trauma-related symptomatology: substance misuse withdrawal states and trauma symptoms are so similar it is possible that persons who have experienced trauma misinterpret substance-related withdrawal states as trauma-related symptomatology, and thus continue to use substances to negate these symptoms. The endorphin compensation hypothesis hence accords with the self-medication hypothesis suggesting different substances may be differentially associated with various trauma symptoms (Stewart et al., 1998).

Women may be at particular risk for this given the strong association between trauma exposure and substance misuse as self-medication in women (Becker, Perry, & Westenbroek, 2012; Volpicelli et al., 1999). Indeed, the 'telescoping' phenomenon (i.e. the propensity for faster progression of substance misuse) is higher in women misusing alcohol, opioids, and cannabis than men, and occurs more quickly in women with depression (Hernandez-Avila, Rounsaville, & Kranzler, 2004; Piazza, Vrbka, & Yeager, 1989).

Figure 2
Theoretical model for the relationship between trauma, substance use, and trauma-related symptomatology

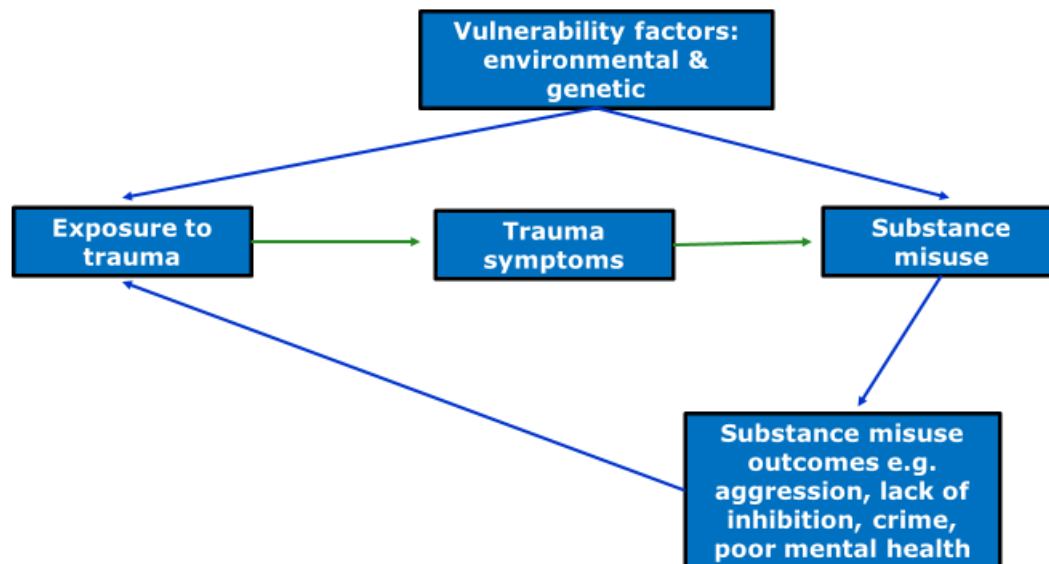


Figure 2 above depicts the theoretical model stemming from the background literature, highlighting how the different paths are currently evidenced; overall it is an adapted self-medication model. The two green-coloured lines, representing self-medication theory, illustrates how exposure to trauma is a risk determinant for substance misuse (to cope with or avoid stressful trauma-related symptoms), and explains its initiation and continuance. The model further emphasises how the symptoms arising from the trauma, and not the incident *per se*, appears to affect drug use. Given the dearth of research investigating the role of gender within these relationships, gender is not incorporated into the model.

Given the various pathways between trauma exposure and substance use, and among substance use and its effect on trauma-related symptoms and mental disorder, and the significance of gender, the relationship between substance misuse and trauma-related

symptom severity and the role of gender is an area that merits exploration. It is important to better understand how trauma exposure effects the lives of women with respect to substance misuse as treatment options that are appreciative of and sensitive to the individual needs of women offer the best outcome for this cohort of individuals (Aakre et al., 2014; Kelly, Daley, & Douaihy, 2012; McCauley, Killeen, Gros, Brady, & Back, 2012; Salter & Breckenridge, 2014).

Aims of the Thesis

The systematic review's main objective is to investigate if there are gender differences in adult offenders who have used illicit drugs and/or alcohol to apprise gender-specific treatment interventions. The TSI-2 critique seeks to provide a summary of the tool, its characteristics (e.g. reliability and validity), control group norms, and a description of its shortcomings.

The research investigates the psychological sequelae of trauma in high-risk MDOs and their relationship with substance misuse; it further explores whether gender differences exist in those relationships. As past research has been inattentive to differences in sequelae of abuse, important relationships between trauma, substance use, and psychiatric outcomes have been obscured (Schneider, Cronkite, & Timko, 2008). Since more extensive trauma histories are found in persons with comorbid substance misuse and mental disorder, and a history of trauma exposure increases the risks for poorer treatment outcomes due to major mental disorder (Aakre et al., 2014; Rosen, Ouimette, Sheikh, Gregg, & Moos, 2002), the study therefore has important implications for informing treatment interventions for this population with interrelated mental health issues.

In brief, the research involved a two-part mixed methods study. The first part was a quantitative design, including both male and female participants to assess the prevalence of past historical trauma exposure, level of problematic past substance use, and the influence of both factors on current trauma-related symptomatology. Subgroup analyses with males and females separately explored whether there were distinct patterns of association for females in current trauma-related psychological stress whilst identifying specific substances used. Any gender differences arising highlighted areas where differential treatment emphasis may be appropriate, and consequently the second part of the study encompassed a qualitative component. This comprised interviewing a subset of female participants to examine how they perceived the relationship between their experiences of trauma, mental disorder, offending, and past substance use, along with canvassing their views regarding substance misuse treatment effectiveness, and limitations.

CHAPTER 2

GENDER DIFFERENCES IN ILLICIT DRUG AND ALCOHOL-RELATED OFFENDING: A SYSTEMATIC REVIEW

Introduction

It has been established that the use of illicit drugs and/or alcohol are strong correlates/predictors of criminal offending, and are significantly associated with lower odds of desistance from life-course persistent offending (Bennett, Holloway, & Farrington, 2008; Schroeder, Giordano, & Cernkovich, 2007). As highlighted in Chapter 1, past offending and substance use-related research have primarily focussed on males (Holloway & Bennett, 2007; Loxley & Adams, 2009). Regarding drug use, women, when considered, have traditionally been depicted as victims or as weak, self-destructive individuals who have higher levels of psychopathology and psychosocial disadvantage than their male counterparts (Neale, 2004). Likewise, only a limited range of women's issues has been considered such as the effects of dependence on childcare and involvement in prostitution (Neale, 2004). In recent years several studies have emerged highlighting gender differences in the characteristics of drug misuse and associated problems including offending (Holloway & Bennett, 2007).

The purpose of this systematic review is to investigate if there are differences between substance-using male and female offenders, and to identify the relevant specific factors. Understanding the nature of offending, which includes, broadly, offences against the person (violent and/or sexual), and offences against property, for men and women who use substances is essential for informing gender-specific treatment provision.

Objectives

This review examines the empirical evidence relating to gender differences in convicted offenders within the context of their illicit drug and alcohol use. It is a quantitative review given that the probability of the generalisability of the results is maximised in these types of studies, which is important given the review's remit.

Drug use is defined as the consumption of any psychoactive substance, which could be recreational, entheogenic, or dependent use, and may be licit or illicit. Illicit drug consumption will be the primary focus, which for the purposes of this review will be defined as the most prevalently used CNS illegal drugs based on their well-established psychoactive properties. This comprises cannabis, cocaine, and ecstasy (Home Office, 2018).

The legislation of substances in the UK is based on a three-tiered classification system whereby the law ranks their relative harm (Acevedo, 2007). This approach will not exclusively be relied upon as a marker for antisocial and/or criminal activity for the purposes of this review, or the need for treatment provision because it does not correlate with actual considerations of harm (Nutt, King, & Phillips, 2010). Thus, alcohol, although a licit substance, will be included in the review because of its status as the most harmful CNS drug (Nutt et al., 2010).

Although the inappropriate use of licit drugs (e.g. using sleeping pills to get high) and the consumption of substances to produce a drug-like state (e.g. glue, petrol) are considered illicit drug use, they will not be included in this review due to relatively restricted usage and thus are not commensurate with the aims of the review. Likewise,

legal drugs utilised as medication for illnesses, and prescribed and over-the-counter medications used by persons as intended will not be incorporated.

While offending may be broadly defined as any unlawful criminal act, such as the consumption of illegal drugs, the drugs-offending nexus is more expansive. Drug-specific crime includes the possession, manufacture, distribution, or trafficking of illegal drugs. Given that the identification of gender differences in illicit drug and alcohol-related offending to inform treatment interventions is the main remit for this review, the principal focus will be on crimes whereby personal consumption is implicated, and in so doing exclude drug-specific offences associated with commercial activities such as manufacture, possession, and supply; given that drug production and trafficking are linked with drug cartels and organised crime, these too will be excluded.

Drug use may or may not include the commission of violence. Non-violent offending includes acquisitive crimes such as shoplifting. Regarding crimes of violence, encompassing Goldstein's 1985 tripartite conceptual framework, drugs can be related to violent crimes in terms of their psychopharmacological properties (i.e. ingesting substances may lead to violent behaviour), economic compulsive tendencies (i.e. engaging in crime [e.g. robbery]) to support drug use, or system-related whereby violence is intrinsic to drugs (i.e. aggressive patterns of interactions in cartels, gangs and organised crime) (Goldstein, 1985). Since the review's emphasis is on gender differences in personal consumption, systemic violence will be excluded from this review.

- This review specifically addresses the following: Are there gender differences in the characteristics of adult offenders who are identified as using illicit drugs

and/or alcohol, and how would these differences inform gender-specific treatment interventions? This includes demographic differences (e.g. age, education, employment, marital status), substance differences (e.g. type of drug, quantity used, dependence, motivation for using), variances in problems consequent to substance use (e.g. health, relationships, childcare), and offence differences (e.g. types of crime).

As underscored in Chapter 1, there is a paucity of research in the domain of gender differences in substance misuse with offenders; hence a wide-ranging research question was utilised in order to ensure that a sufficient number of pertinent papers were captured.

Method

Criteria for Inclusion and Exclusion of Studies in the Review

The quantitative studies included in the review are focussed on criminal acts related to drug use, as defined above and summarised below applying PICO (population, issue, comparators, outcome) criteria. Findings were accepted if $p < .05$.

Population: The population of relevance includes male and female adult offenders whereby the ingestion of personal-use quantities of alcohol and/or illicit drugs is involved. Although there is no single law that defines the age of an adult, the United Nations Convention on the Rights of the Child deems an adult as any person 18-years-old or older; this definition will be applied for the purposes of this review.

Issue: The phenomena of interest were distinguishing between features of drug-using female and male offenders including demographics, quantity, dependence, and motivation for using, problems arising from use such as the impact on health and relationships, and differences in types of crime committed.

Comparators: The differences between male and female drug-using sentenced offenders.

Outcomes: Offending and recidivism, offence type, prevalence and rate of offending, drug(s) used, motives for using, socio-demographic factors, psychosocial characteristics (e.g. mental disorder and other mental health problems), drug and/or alcohol dependence, and physiological phenomena (e.g. tolerance) as an antecedent and/or consequence of drug use.

Publication: Only papers published between 2000 and 2019 are included in the review; Holloway and Bennett (2007) indicated little related research was completed before this period.

Country of origin: Evidence may be from any country; however, only English-language studies are included.

Search Strategy for Identification of Relevant Studies

The search strategy located studies published in peer reviewed journals via a three-stage approach. First, preliminary scoping searches in major databases to identify key

words and controlled vocabulary were undertaken to inform the search strategy's design (the titles' and abstracts' text words along with the articles' index words were analysed). Second, key terms and index words were investigated through all databases involved in the review, as detailed below. Third, to ensure a robust approach, additional studies were gleaned from backward citation searching (i.e. scrutinisation of the reference lists for all included articles) along with other search methodologies noted in the subsequent section.

Bibliographic Databases:

There is usually considerable overlap amid databases. Nonetheless, the following bibliographic databases were explored in September 2019:

1. ASSIA (Applied Social Sciences Index and Abstracts)
2. CINAHL (Cumulative Index to Nursing and Allied Health)
3. Embase
4. MEDLINE
5. PsycINFO

Gateways:

1. Campbell Collaboration
2. Cochrane Library
3. University of York Centre for Reviews and Dissemination (comprising Health Technology Assessment Database)

Funded Research/Specialist Databases:

The following non-bibliographic databases were investigated:

1. CAMH (Centre for Addiction and Mental Health)
2. DrugScope
3. National Treatment Agency (NTA) for Substance Misuse
4. United Nations Office on Drugs and Crime
5. National Institute on Drug Abuse
6. European Information System on Alcohol and Health (EISAH)
7. Alcohol and Alcohol Problems Science Database (ETOH)
8. Drug Data Warehouse

The search strategies employed included combinations of concepts related to the specified illicit drugs and alcohol, offending, and gender, generating a bespoke inventory that was respondent to the review's remit. The search strategy included both text words in the titles and abstracts, and indexed keywords of the databases. The syntax was tailored commensurate to the individual database. The PsycINFO search strategy is listed in Appendix 1.

At this stage, the search strategy did not comprise terms in relation to the studies' outcomes until after the first trial search was completed. The risk of operationalising a too stringent search strategy *a priori* may have resulted in false negatives. That is, the exclusion of important studies, and so search terms regarding outcomes were only included if the results of the combined search related to substances, offending, and gender differences indicated it as necessary. Moreover, search filters for study designs were used; just randomised controlled trials (RCTs), experimental designs, and quasi-experimental designs were included. This was deemed prudent given the review's treatment focus to ensure conclusions drawn were based on rigorous designs.

Primary Studies:

Using backward citation searching, the reference sections of relevant research gleaned to date (e.g. Griffin & Rodriguez, 2011; Holloway & Bennett, 2007; Neale, 2004) were hand-searched to peruse for additional studies subject to the research meeting the aforementioned inclusion criteria.

Grey Literature/Hidden Web Material:

Non-commercially published work was also sought to provide a further source of studies to increase the review's effectiveness. This included non-journal literature such as non-published/non-commercial reports, conference papers, and dissertation abstracts.

The Internet was interrogated, which included Google and Google Scholar searching. Websites germane to the review were identified. It was recognised the Internet does not constitute a systematic search methodology, but it provided a helpful complement to the bibliographic databases, particularly for retrieving non-commercial and unpublished material, and research in progress. The Internet also afforded the review with other sources such as reports, technical notes, and blogs.

There are no existing systematic reviews in the area to date, hence this was not a realistic retrievable.

Finally, four leading researchers and expert practitioners in the area were contacted in order to compensate for shortfalls of other search strategies, and to ask about studies in progress.

Assessment of the Risk of Bias

In evaluating the evidence, the methodological quality of the individual studies was assessed. The Cochrane Collaboration advocates the use of risk of bias assessment tools for non-randomisation studies yet make no specific recommendations regarding a single instrument (Viswanathan et al., 2012). Therefore, this review utilised a standardised critical appraisal instrument created for specific study designs by the Joanna Briggs Institute (JBI) (JBI, 2014), which has been used in comparable studies (e.g. McMurran, Riemsma, Manning, Misso, & Kleijnen, 2011).

The Meta Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI) for randomised control/pseudo-randomised trial designs was tailored for the review, and operationalised to gauge quantitative papers (see Appendix 2). The JBI-MAStARI comprises different judgements appertaining to randomisation, allocation, comparisons, outcome measurements, and statistical analyses (JBI, 2014). Each selected study was awarded a 'yes', 'no', 'unclear', or 'not applicable' score for the specific JBI-MAStARI checklist criteria items using specified guidelines for ascribing ratings. The risk of bias was judged discretely for all papers to create a single overall evaluation per study, with each categorised as low quality (significant flaws that may invalidate results), moderate quality (some bias but not sufficient to invalidate the results), or high quality (results considered valid), as it is recognised that presenting a composite risk of bias assessment score (i.e. a global numeric rating) is unsuitable since this can ascribe precision that is unfounded (Viswanathan et al., 2012). The processes, decisions, and justifications for the study-specific risk of bias ultimate judgements were recorded to aid transparency and reproducibility.

All papers retrieved were included. The quality assessment was conducted by the researcher with any uncertainty resolved through a consensus-based decision-making process, which included discussion and verification by a second reviewer – a chartered psychologist and associate professor of psychology with expertise in systematic reviews (NH); this comprised more than the recommended 10%. The researcher assessed and reported on the methodological validity of the research; the results were drawn upon for descriptive reasons in the synthesis of evidence.

Data Extraction

The JBI-MAStARI standardised data extraction tool was tailored for use for the quantitative studies included in the review. The extracted data include information about the studies' participants, methodologies used, and significant results pertaining to the review question and objectives. Additionally, conclusions developed by the studies' authors were also extracted. A data extraction pilot test was completed *a priori* in order to minimise the risk error when extracting data from the relevant studies.

Data Analysis

Although synthesising the data via statistical means (e.g. meta-analysis) is desirable because it provides a summary estimate of effect sizes in order to deduce summary conclusions about a body of research (JBI, 2014), this was not feasible. As the studies' methodologies were not homogeneous, statistical aggregation was inappropriate as generalisations yielded would have been invalid. The data are therefore presented via descriptive synthesis, including tabulation and narrative summary. This comprises a summation of the raw data extracted as well as contextual information such as participant descriptions and study characteristics. Tables and figures are used to assist

presentation of the results, enabling differentiations in study designs and sources of biases to be readily assessed.

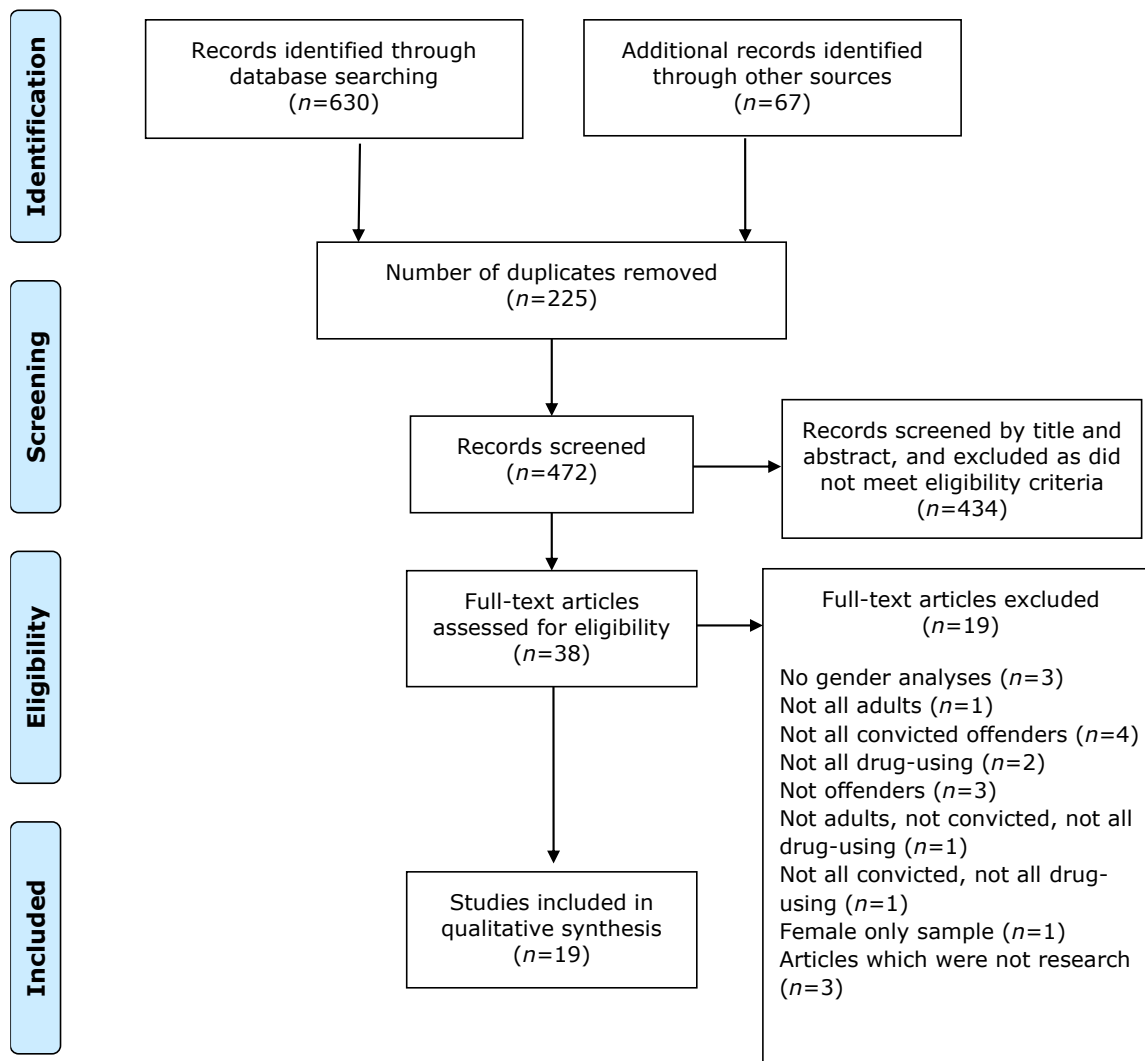
Results

Sample

Overall, the database searches yielded 630 titles; also, 67 titles were retrieved via supplemental searches, hand-searching, and contacts with academics and clinicians. Subsequent to deduplication, 472 papers remained, which were screened utilising the inclusion and exclusion criteria. From this, 19 papers were judged relevant for inclusion within the final review.

Figure 3 details the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses; Moher, Liberati, Tetzlaff, & Altman, 2009) flow diagram, which summarises the flow of papers throughout the search and screening procedure.

Figure 3
PRISMA flow diagram



Summary of Included Studies

The review comprises 19 publications. These were collated pertaining to their central focus, which included impaired drivers (Group A), imprisoned offenders (Group B), offenders at liberty in the community under probation/parole (Group C), and prisoners released to the community (Group D).

Contained within Group A are four papers (Brown et al., 2012; Lapham, Skipper, Hunt, & Chang, 2000; Lapham et al., 2001; LaPlante, Nelson, Odegaard, LaBrie, & Shaffer, 2008), Group B includes 11 reports (Butler, Levy, Dolan, & Kaldor, 2003; Gordon et al.,

2013; Kinner, Moore, Spittal, & Indig, 2013; Langan & Pelissier, 2001; Light et al., 2013; Messina, Burdon, & Prendergast, 2003; Messina, Grella, Burdon, & Prendergast, 2007; Pelissier, Camp, Gaes, Saylor, & Rhodes, 2003; Pelissier, 2004; Staton-Tindall et al., 2007; Zlotnick et al., 2008a), Group C has two papers (Cobbina, Huebner, & Berg, 2012; Johnson, Friedmann, Green, Harrington, & Taxman, 2011), while Group D comprises two studies (Gordon et al., 2014; Travers & Mann, 2018). Table 1 below details the studies.

Publications emanated primarily from the United States (US) ($n=14$), but also Australia ($n=2$), UK ($n=2$), and Canada ($n=1$). The overall number of participants involved in the review comprised 136,855. This ranged from 184 to 110,133. Participants included 112,890 (82.49%) males and 23,965 (17.51%) females, a ratio of approximately 4.75:1.

The main gender-related differences investigated in Group A concerned prevalence of comorbid psychiatric disorders, risk factors affecting recidivism, and treatment efficacy for recidivists. Group B examined gender differences regarding demographics, prevalence of past and present use, drug consumption patterns including injecting drug use (IDU) and heroin use in-prison, relationship between in-prison opiate substitution treatment (OST) and IDU, prevalence of ACEs and their impact on adult trauma-related distress, criminal activity, reconviction, criminal thinking, treatment entry, treatment efficacy, and post-release drug use. Foci for Group C included recidivism causes, and intervention outcomes, whilst Group D concentrated on reconviction, and OST's efficacy.

Concerning the studies' methodologies, one RCT, and three randomised clinical trials were included. Most studies were quasi-experimental designs comprising six cohort studies, and nine surveys employing self-report surveys/psychometric tests as

measurement methods. Data analysis typically involved conducting correlation and regression analyses.

Table 1
Summary characteristics of included studies

Study reference, location of study, and design	Target population/control	Gender differences
Group A		
<u>Brown et al. (2012)</u> Canada, re-analysis of data from previous RCT (Brown et al., 2010)	Investigated intervention responsiveness in DWI (driving while impaired) recidivists exposed to 2 brief interventions. Adult drivers convicted of ≥ 2 DWI offences in past 15-years, alcohol problems in past 6-months, and not currently in treatment. $N=184$ (♂=165, ♀=19). Received either brief motivational interviewing (BMI; $n=92$) or control information-advice intervention (CTL; $n=92$). Gender analysis per category not reported. Followed-up at 6- (T1) and 12-months (T2).	A significant interaction effect of gender x follow-up episode on change in percentage of risky drinking days was found, $F(1, 180)=4.68$, $p<.05$, partial $\eta^2=.03$, with <i>post-hoc</i> analysis indicating ♂ improved more at T2.
<u>Lapham et al. (2000)</u> US, cohort	Investigated gender differences in factors affecting recidivism in convicted DWI offenders referred to the Lovelace Comprehensive Screening Program (LCSP) between 1 st April 1989-13 th February 1992, and interviewed 5-years later to determine recidivism. Sample's subset: aged ≥ 31 -years. $N=511$ (♂=248, ♀=263).	Age group at screening was not associated with recidivism for ♀ but strongly associated for ♂ (22% vs. 24%, $p<.001$) ≥ 31 .
<u>Lapham et al. (2001)</u> US, cohort	Examined the prevalence of alcohol use and comorbid psychiatric diagnoses in convicted DWI offenders referred to LCSP and differences vis-à-vis the general population; located and interviewed between 25 th January 1994-30 th June 1994. Aged 23-54-years. $N=1,105$ (♂=493, ♀=612).	♀ more likely divorced/separated/widowed (37.3% vs. 23.5%, $p<.01$), low earners (<\$16,800/year)(36.1% vs. 25.2%, $p<.01$), and less likely had ≥ 3 prior DWIs (1995-1997)(6.5% vs. 15.8%, $p<.01$). ♂ more likely reported alcohol use disorders (AUD)(abuse/dependence)(91.3% vs. 85.4%, $p<.01$).
<u>LaPlante et al. (2008)</u> US, cohort longitudinal study	Examined psychiatric and substance use histories of repeat DUI (driving under the influence) offenders electing to attend the court-approved Middlesex DUI of Liquor (MDUIL) programme, a licensed residential	<u>Demographics ($p<.05$):</u> ♀ more likely White (92.5% vs. 86.1) and lower income (<\$20,000/year)(58.8% vs. 25.5%), less likely married (11.8% vs. 20.1%) and educated ($\leq$ high-school)(55.9% vs. 75.9%). ♂ more likely had physical abuse history (22.1% vs.

	facility providing treatment and education, instead of prison. $N=729$ (♂=593, ♀=136). $M(SD)$ age: ♂=39.4 (11.9), ♀=41.0 (10.1).	12.1%), and fewer DUI arrests ($M(SD)=2.3$ (.6) vs. 2.6 (1.0)). <u>Psychiatric diagnoses (lifetime; $p<.01$):</u> ♀ more likely reported alcohol dependence (55.1% vs. 37.4%), bipolar I or II (13.2% vs. 5.9%), generalised anxiety disorder (GAD)(19.1% vs. 5.9%), and PTSD (30.1% vs. 9.4%). ♂ more likely reported alcohol abuse (60.7% vs. 40.4%), and drug abuse (27.8% vs. 17.6%). <u>Psychiatric diagnoses (past-year; $p<.01$):</u> ♀ more likely reported alcohol dependence (42.6% vs. 28.5%), bipolar I or II (13.2% vs. 3.5%), GAD (16.9% vs. 4.2%), and PTSD (24.3% vs. 8.6%). ♂ more likely reported alcohol abuse (44.2% vs. 34.6%). <u>Regressions controlling for demographic differences (above):</u> For each lifetime disorder where ♀ and ♂ differed, gender contributed significantly ($p<.05$) to prediction when entered into the equation after the 6 demographics. For all past-year disorders where ♀ and ♂ differed except alcohol abuse (i.e. alcohol dependence, bipolar, GAD, and PTSD), gender contributed significantly ($p<.05$) to prediction after the 6 demographic controls. <u>Extent of psychiatric comorbidity with addiction-related disorders in MDUIL</u> <u>Lifetime:</u> More ♂ reported an addictive disorders history only (i.e. alcohol, tobacco, drug, gambling addiction, but no other psychiatric disorders)($p<.01$). More ♀ reported a history of substance- and gambling-related disorders and ≥ 3 disorders ($p<.001$). <u>Past-year:</u> ♂ more likely had no past-year disorder or alcohol-related disorder only ($p<.01$). ♀ more likely had substance-related or gambling with 1 disorder ($p<.001$), 2 disorders ($p<.05$), or ≥ 3 disorders ($p<.01$). <u>Regressions controlling for demographics:</u> For both lifetime and past-year comorbidities, ♀ had more extensive comorbidity than ♂ ($p<.05$).
Group B <u>Butler et al. (2003)</u> Australia, cohort (survey)	Studied the prevalence of past and present tobacco, alcohol, and illicit drug use in convicted offenders in 27 prisons (♂=24, ♀=3) in New South Wales (NSW). $N=789$ (♂=657, ♀=132).	<u>Alcohol use:</u> ♀ more likely had 'safe' AUDIT levels (39% vs. 26%, $p=.02$). <u>Illicit drug use:</u> ♀ more likely reported ever (48.5% vs. 29.2%, $p<.000$) or regularly used (39.4% vs. 21.5, $p<.000$) heroin, ever (28.8% vs. 16.1%, $p<.000$) or regularly used (17.4% vs. 6.2%, $p<.000$) cocaine, ever (34.8% vs. 10.4%, $p<.000$) or regularly used (34.8% vs. 9.7%, $p<.000$) prescribed methadone, or ever (16.7% vs. 6.2%, $p<.000$) or regularly used (11.4% vs. 2.7%, $p<.000$) non-prescribed methadone in the 12-months pre-imprisonment. ♀ more likely reported ever used morphine (10.6% vs. 5.3%, $p<.03$).

<u>Langan & Pelissier (2001)</u> US, face-to-face interview (survey)	Examined prisoners' gender differences enrolled in the Federal Bureau of Prison's Drug and Alcohol Treatment Program across 20 minimum, low, and medium federal prisons. $N=1,644$ (♂=1,326, ♀=318). M age: ♂=37.22, ♀=35.45.	methamphetamine (19.4% vs. 7.0%, $p<.001$). More ♂ reported lifetime opioids (other than heroin) IDU history (51.8% vs. 42.7%, $p<.05$); ♀ more likely reported lifetime OST (32.2% vs. 23.9%, $p<.05$). <u>NSW</u>: Lifetime IDU more likely in ♀ (53.9% vs. 43.8%, $p=.011$). Among those with a lifetime IDU history, lifetime in-prison IDU more common in ♂ (44.1% vs. 33.3%, $p<.05$); ♂ more likely in-prison to inject heroin (35.6% vs. 24.8%, $p<.05$), other opioids (22.6% vs. 13.3%, $p<.05$), and methamphetamine (24.3% vs. 11.4%, $p<.01$). ♀ more likely reported lifetime cocaine IDU history (62.9% vs. 45.1%, $p<.001$), and a lifetime OST history (77.1% vs. 55.1%, $p<.001$). Logistic regression analyses showed a significant interaction between sex and jurisdiction ($p=.002$); the planned comparison indicated the observed sex difference in the prevalence of in-prison IDU was greater in Queensland than NSW (difference=18.4%, $p=.003$). <u>Descriptive statistics/bivariate tests</u>: ♀ more likely used drugs daily (83% vs. 68%; $X^2=27.94$, $p=.01$), engaged in daily polydrug use (57% vs. 42%; $X^2=23.30$, $p=.01$), and daily heroin use (21% vs. 15%; $X^2=7.92$, $p=.01$). ♂ more likely reported hedonistic reasons for using (49% vs. 34%; $X^2=22.27$, $p=.01$); ♀ more likely used drugs to alleviate physical/emotional pain (27% vs. 13%; $X^2=39.71$, $p=.01$). ♀ less likely completed 12th grade/obtained General Educational Development (GED)(65% vs. 76%; $X^2=17.74$, $p=.01$). ♀ more likely raised in homes where drug use present (38% vs. 18%; $X^2=61.77$, $p=.01$), and experienced physical/sexual abuse in those homes (55% vs. 19%; $X^2=164.52$, $p=.01$). ♀ more likely pre-arrest had a close friend (68% vs. 57%; $X^2=13.19$, $p=.01$) or spouse (60% vs. 23%; $X^2=163.55$, $p=.01$) with a drug problem. ♀ had higher lifetime depression rates (DSM-III-R)(33% vs. 15%; $X^2=52.54$, $p=.01$). ♀ more likely unfavourably self-rated physical health (24% vs. 16%; $X^2=11.16$, $p=.01$), and reported plans to live with their children post-release (60% vs. 40%; $X^2=44.26$, $p=.01$). Of the 5 controls included in each model above, ♂ were older ($M=37.22$-years vs. 35.45; $T=3.32$, $p<.01$), more likely to be White (66% vs. 49%; $X^2=29.67$, $p=.01$), with past incarcerations (66% vs. 44%; $X^2=54.76$, $p=.01$). <u>Regression analyses</u>: ♀ more likely used drugs daily (.01), engaged in daily polydrug use (.01), daily heroin use (.01), and daily cocaine use (.02). ♂ cited hedonism main reason for use (.01); ♀ used to alleviate pain (.01). ♀ less likely completed 12th Grade/GED (.01). ♀ more
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<u>Light et al. (2013)</u> UK, cohort longitudinal study	Investigated substance misuse and mental health of newly-sentenced prisoners in England and Wales in 2005/2006 using the Surveying Prisoner Crime Reduction longitudinal survey, which describes the prisoner population and tracks progress across sentences and on release. $N=1,435$ (♂=1,303, ♀=132). $M(SD)$ age: ♂=29.98 (9.07), ♀=31.17 (8.51).	likely had drug use in family of origin (.01), experienced childhood physical/sexual abuse (.01), pre-arrest had close friend (.01) or spouse (.01) with drug issues, depression diagnosis (.01), rated physical health unfavourably (.01), and planned to live with children post-release (.01). ♂ more likely drank alcohol in year pre-custody (80% vs. 64%, $p<.01$), and 4-weeks pre-custody ($n=1,120$; ♂=1,035, ♀=85)(87% vs. 75%, $p<.01$). Of $n=1,432$; ♂=1,300, ♀=132 (3 respondents did not answer), ♀ more likely ever used crack (58% vs. 42%, $p<.01$), heroin (55% vs. 39%, $p<.01$). ♀ more likely used Class A drugs only in 4-weeks pre-custody (21% vs. 11%, $p<.01$); ♂ more likely reported Class B and/or Class C only (20% vs. 9%, $p<.01$). Of those ever-used crack ($n=622$; ♂=545, ♀=77), ♀ more likely reported using in year pre-custody (94% vs. 76%, $p<.01$). ♀ binge drinkers ($n=32$) had higher reconviction rate compared to ♂ who did not binge drink ($n=27$)(75% vs. 37%, $p<.01$). This relationship not observed in ♂. Of prisoners who used heroin in the 4-weeks pre-custody and reported spend/day ($n=288$; ♂=236, ♀=52), ♀ spent more/day ($M(SD)=£61.92$ (56.33) vs. £45.81 (47.70)). Of prisoners who used heroin in-prison ($n=316$; ♂=276; ♀=40), ♂ more likely used heroin for the first time in-prison (38% vs. 10%, $p<.01$). Of $n=1,433$ (♂=1,301, ♀=132), ♀ more likely reported needing help with a drug problem on prison-entry (49% vs. 29%, $p<.01$). ♀ prisoners more likely associated drug use with their offending ($p<.01$): regarding offence committed in the 12-months pre-custody, ♀ more likely used illegal drugs when offence(s) committed (68% vs. 55%), committed the offence(s) to get money for drugs (66% vs. 38%), reported offending was connected with drug use always (50% vs. 28%), and committed the offence(s) to support someone else's drug use (48% vs. 22%). <u>Demographics ($p<.001$):</u> ♂ more likely employed pre-incarceration (53% vs. 33%) and reported their job as their primary financial support source (44% vs. 23%). ♂ received nearly 2x legal income in the year before current incarceration (\$14,000 vs. \$8,000). ♂ more likely to have children⁺ (74% vs. 54%). ♀ 8x more likely reported adulthood⁺ sexual/physical abuse (25% vs. 3%). [⁺data collected from partial sample due to survey revisions; ♂=801, ♀=1,933]. <u>Drug use ($p<.001$):</u> ♀ 2x likely used daily cocaine/crack (36% vs. 16%) and opiates
<u>Messina et al. (2003)</u> US, cross-sectional survey	Compared intake data of prisoners entering Substance Abuse Programs in 15 Californian prison-based therapeutic communities (institutional therapeutic communities) with 6-24-months left to serve. $N=8,104^*$ (♂=3,595, ♀=4,509) *Authors note Ns vary slightly due to missing data. $M(SD)$ admission age: ♂=34.5 (8.9), ♀=36.0 (7.6).	

<i>Messina et al. (2007)</i> US, cross-sectional survey	Analysed baseline data from the California Department of Corrections and Rehabilitations Treatment Initiative to examine the prevalence of ACEs amongst drug-dependent ♂ and ♀ prisoners, and the relationship between ACEs and adulthood trauma-related distress. $N=741$ (♂=425, ♀=316). M age=34.	(44% vs. 22%) 60-days pre-incarceration. <u>Criminal activity ($p<.001$):</u> ♂ reported more severe criminal histories before current incarceration. ♂ younger at first arrest (17.1-years vs. 21.3), with more lifetime arrests (17.4 vs. 14.7), and longer lifetime incarceration (5.5-years vs. 3.2). <u>Logistic regression models ($p<.001$):</u> ♀ 3x less likely used cannabis daily, but more likely used daily opiates (20x), cocaine/crack (20x), ≥ 2 drugs (4x). ♀ more likely had DSM-IV drug abuse/dependence (16x), experienced depression (10x), tension/anxiety (10x), hallucinations (6x), trouble concentrating (8x), trouble controlling violent behaviour (4x), serious thoughts of suicide (11x), attempted suicide (21x), childhood physical/sexual abuse (13x), adult physical/sexual abuse (104x). ♀ less likely completed high-school (3x), employed pre-prison (6x), support child upon release (6x, only for participants with children). <u>Prevalence of ACEs:</u> ♀ more likely reported emotional abuse/neglect (39.8% vs. 20%; $X^2=34.8$, $p<.001$), physical abuse (29% vs. 20.2%; $X^2=7.58$, $p<.006$), and sexual abuse (39.2% vs. 8.5%; $X^2=100.80$, $p<.001$). ♂ more likely reported incarcerated family member (41.6% vs. 30.3%; $X^2=9.88$, $p=.002$) and parental substance abuse (53.6% vs. 44%; $X^2=6.76$, $p<.009$). ♀ more likely reported ≥ 5 ACEs before age 16 (22.8 % vs. 13.3%; $X^2=18.37$, $p<.003$). ♀ more likely reported continued sexual abuse >16-years (28% vs. .7%; $X^2=124.82$, $p<.001$). <u>Relationships between categories of ACEs:</u> z transformations showed among 13 correlations the correlations between ACEs were stronger for ♀; e.g. childhood sexual abuse was more strongly correlated with emotional abuse ($z=-2.21$, $p<.05$), physical neglect ($z=-3.61$, $p<.01$), physical abuse ($z=-4.95$, $p<.01$), family violence ($z=-2.10$, $p<.05$), family member incarcerated ($z=-3.26$, $p<.01$), and out-of-home placement ($z=3.53$, $p<.01$). Other z values not reported. <u>Bivariate comparisons (X^2 and T-tests) of background characteristics (♂=427, ♀=315):</u> ♂ and ♀ differed on numerous background characteristics; findings not shown. ♀'s mean number of arrests/incarcerations increased with greater ACEs exposure but similar increases insignificant for ♂. <u>Pairwise comparisons (♂=215, ♀=157)($p<.001$):</u> Mean raw scores on each TSC-40 (Trauma Symptom Checklist-40) subscale (dissociation, anxiety, depression, sex abuse trauma index, sleep disturbance, sexual problems) higher for ♀; overall traumatic distress mean raw
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<u>Pelissier et al. (2003)</u> US, cross-sectional survey	Examined gender differences in demographics, treatment efficacy, and predictors of post-release 3-year outcomes among drug-using federal prisoners. $N=2,315$ (♂=1,842, ♀=473) (treatment subjects=1,193, comparison subjects=1,122). M age at release: ♂=37-years, ♀=35.	scores higher for ♀ as ACEs exposure increased. Data not provided. <u>Linear regressions ($N=370$)(full data not cited):</u> ♀ gender significantly and positively related to all seven models (six TSC-40 subscales, and overall traumatic distress). Greater ACEs exposure (combined with pre-existing substance misuse and offending histories) increases the likelihood of adult mental health issues regardless of gender although ♀ had higher scores on all outcomes. <u>Demographics ($p<.01$):</u> ♀ less likely employed pre-incarceration (40% vs. 55%), less educated (11.57-years vs. 12.16), more likely used ≥ 1 'hard' drugs (e.g., illicit drugs other than cannabis) daily in the year before most recent arrest (48% vs. 28%), and more likely had spouse with a drug problem (55% vs. 23%). ♀ more likely had lifetime depression diagnosis (33% vs 16%), mental health treatment history (40% vs. 20%), and less likely had prior incarcerations (40% vs. 69%). <u>Recidivism (arrest for new offence/revocation within 3-years post-release among supervised subjects)(♂=1,842, ♀=473):</u> Wald-tests showed significant difference between ♂/♀ for one predictor associated with decreased recidivism—♂ less likely recidivated if lived with spouse post-release (-.34 vs. -.06, $p<.05$, one-tailed test). <u>Drug use post-release (♂=1,692, ♀=430):</u> Wald-tests showed ♀ with mental health treatment history less likely engaged in post-release drug use (.34 vs. -.02, $p<.05$, one-tailed test).
<u>Pelissier (2004)</u> US, cross-sectional survey	Examined gender differences in the predictors of substance use treatment entry, and of the combination of treatment entry and completion. Utilising Pelissier et al.'s (2003) sample, prisoners were within 3-years of release with moderate-severe substance problems. $N=2,219$. ♂=1,734 (1,189 treatment, 545 comparison participants), ♀=485 women (300 treatment, 185 comparison participants).	<u>Treatment entry:</u> ♀ with a moderate-severity offense less likely entered treatment, ♂ with a moderate-severity offense more likely entered treatment (-.375 [$SE=.142$, $p<.05$] vs. .203 [$SE=.081$, $p<.01$]). Wald-test results for the difference between coefficients were significant ($\chi^2=12.5$; $p<.05$). ♀ with 'average/good' family ties more likely entered treatment while ♂ with 'average/good' family ties less likely (.269 ($SE=.121$, $p<.05$) vs. -.273 ($SE=.089$, $p<.01$)). ♀ not employed pre-incarceration more likely entered treatment; ♂'s employment history unrelated to treatment entry (.622 [$SE=.312$, $p<.05$] vs. -.132 [$SE=.201$, ns]). Wald-tests indicated different coefficients for ♂ and ♀: $\chi^2=13.05$ for family ties and $\chi^2=4.14$ for not in labour force.

<u>Staton-Tindall et al. (2007)</u> US, cross-sectional survey	Examined gender differences in psychosocial variables, treatment engagement, and criminal thinking (CT) between offenders enrolled in 20 prison-based substance misuse treatment in 5 states using CJ-CEST's (Criminal Justice Client Evaluation of Self and Treatment) subscales. $N=2,774$ (♂=1,950 from 15 programmes, ♀=824 from 5 programmes). M age=34.	♀ who used alcohol only more likely entered treatment (1.157 [$SE=.508$, $p<.05$] vs. -.058 [$SE=.138$, ns]). Wald-tests showed coefficient for alcohol use ($\chi^2=5.68$) was a significant gender difference. <u>Treatment entry and completion:</u> ♀ with a moderate-severity offence less likely completed treatment (-.264 [$SE=.121$, $p<.05$] vs. .108 [$SE=.065$, ns]). ♂'s nonsignificant coefficient was in opposite direction ($\chi^2=9.40$). ♀ older at first arrest more likely completed treatment (.031 [$SE=.013$, $p<.05$] vs. -.002 [$SE=.006$, ns]). ♂'s nonsignificant coefficient differed significantly from ♀ ($\chi^2=7.44$) and was in opposite direction. ♂ with average/good family ties less likely completed treatment (-.197 [$SE=.073$, $p<.01$] vs. .192 [$SE=.104$, ns]). ♀'s coefficient differed from ♂ ($\chi^2=9.39$) and, although not significant, was in opposite direction. ♂ with drug treatment history less likely completed treatment (-.094 [$SE=.046$, $p<.05$] vs. .079 [$SE=.087$, ns]). ♀'s coefficient different from ♂'s ($\chi^2=19.59$). ♀ with ASPD only more likely completed treatment (-.506 [$SE=.180$, $p<.01$] vs. .057 [$SE=.084$, ns]), which differed between ♀/♂ ($\chi^2=5.12$). <u>Psychosocial functioning:</u> ♀-programmes reported greater anxiety scores (29.17 vs. 26.51, $p=.009$). <u>CT:</u> ♂-programmes had higher scores on all subscales-entitlement (20.01 vs. 17.44, $p<.000$), justification (21.63 vs. 20.16, $p=.033$), power-orientation (26.69 vs. 23.94, $p=.004$), cold-heartedness (23.30 vs. 20.40, $p=.002$), criminal rationalisation (32.60 vs. 28.88, $p=.001$), and personal irresponsibility (21.99 vs. 18.55, $p<.000$). <u>Treatment engagement:</u> ♀-programmes reported higher scores including counsellor rapport (41.84 vs. 35.50, $p=.010$) and treatment participation (43.39 vs. 40.62, $p=.017$). <u>Gender as a moderator of the relationship between offenders' treatment engagement and psychosocial functioning ratings (controlling for age, race, and length of treatment time):</u> ♀-programmes had stronger negative relationships between counsellor rapport and depression ($p=.016$), anxiety ($p=.014$), and decision-making ($p=.006$). ♀-programmes had stronger relationships between treatment participation and depression ($p=.029$), anxiety ($p=.010$), poor decision-making ($p<.000$), and hostility ($p=.044$).
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<i>Zlotnick et al. (2008a)</i> US, cross-sectional survey	Examined psychiatric comorbidity in inmates newly-admitted to substance abuse treatment programmes in 13 prisons. $N=272$ (♂=180, ♀=92). $M(SD)$ age=35.1-years (♂=34.7 (9.6), ♀=35.7 (9.2)).	♂-programmes had stronger relationships between low risk-taking and increased counsellor rapport ($p=.021$). These findings suggest the relationship between psychosocial functioning and treatment engagement moderated by gender. <u>Gender as a moderator of the relationship between treatment engagement and CT (controlling for age, race, and length of time in treatment):</u> Only the association between cold-heartedness and treatment engagement (counsellor rapport and treatment participation) was different by programme gender. ♂-programmes reported stronger relationships between high cold-heartedness and low treatment engagement ($p<.000$). This suggests that although higher CT scores are related to lower treatment engagement scores, this relationship did not differ by programme gender, despite the earlier finding ♂-programmes report higher CT levels. <u>Demographics:</u> ♀ less likely used alcohol daily past 6-months (16.9% vs. 22.6%, $p=.04$), employed past 6-months (41.3% vs. 65.6%, $p<.001$), spent time in custody (M months (SD) 39.5 [40.6] vs. 70.6 [70.9], $p<.001$), and committed assault ever (24.6% vs. 75.4%, $p=.001$). ♀ more likely homeless past 6-months (10.9% vs. 2.8%, $p=.013$), reported IDU (48.9% vs. 30%, $p=.002$), lifetime psychiatric hospitalisation (29.3% vs. 13.4%, $p=.001$), and lifetime suicide thoughts/feelings/attempts (28.3% vs. 12.8%; $p=.002$). <u>Psychiatric disorders:</u> ♀ more likely had any lifetime psychiatric disorder, after adjusting for race, marital status, employment status, and research centre (64.1% vs. 35.0%, adjusted $OR=3.5$, $p<.0001$). ♀ more likely had an eating disorder (5.4% vs. .6%, adjusted $OR=18.0$, $p=.0277$), major depression (38.0% vs. 20.6%, adjusted $OR=2.5$, $p=.0031$), borderline personality disorder (BPD)(20.7% vs. 8.3%, adjusted $OR=2.9$, $p=.0122$), or any affective (44.6% vs. 27.2%, adjusted $OR=2.3$, $p=.0043$), or anxiety disorder (33.7% vs. 17.8%, adjusted $OR=2.4$, $p=.0055$). ♀ less likely reported ASPD (31.5% vs. 47.2%, adjusted $OR=.5$, $p=.0277$). Regarding any severe disorder (major depression/psychotic disorders/bipolar disorder), ♀ more likely affected by ≥ 1 disorders (46.7% vs. 26.7%, adjusted $OR=2.7$, $p=.0009$). ♀'s adjusted Internalising Disorder Screen $M(SD)$ scores higher (3.22 [1.094] vs. 2.31 [1.617], $p<.0001$).
Group C		

<u>Cobbina et al. (2012)</u> US, cross-sectional retrospective study	Examined gender differences in causes of recidivism in parolees from one Midwestern state's prisons in 2000; focussed on the role of social ties and criminal history in influencing reoffending risk. $N=570$ (♂=401, ♀=169). M age=32.	♀ more likely reported drug abuse (87% vs. 68%, $p<.05$); ♂ reported higher alcohol abuse incidence (73% vs. 49%, $p<.05$). Cox Proportional Hazard Models showed ♀ with drug use histories recidivated more quickly (.13 vs. -.02, $p<.05$). Interaction models suggested the effect of drug use history was significant for ♀ only (1.55, 1.62; $p<.05$).
<u>Johnson et al. (2011)</u> US, randomised clinical trial	Examined gender differences concerning 2 interventions for parolees with pre-incarceration substance use disorders at moderate-high recidivism risk. $N=431$ (♂=354, ♀=77). $M(SD)$ age: ♂=34.2 (8.6), ♀=35.6 (8.5). Intervention 1 (Collaborative Behavioural Management; CBM): $n=221$ (♂=182, ♀=39). Intervention 2 (standard parole): $n=210$ (♂=172, ♀=38). Follow-up data from months 4-9 available for $n=410$.	<u>Demographics:</u> ♀ less likely lived with spouse/partner (32% vs. 46%, $p<.05$), more likely have children (82% vs. 70%, $p<.05$) and lived with them pre-incarceration (40% vs. 26%, $p<.05$), less likely employed pre-incarceration (33% vs. 51%, $p<.05$), fewer lifetime arrests ($M(SD)=6.6$ [5.2] vs. 13.7 [20.8], $p\leq.001$), older at first arrest ($M(SD)=22.2$ [8.1] vs. 16.6 [4.8], $p\leq.001$), shorter incarceration histories ($M(SD)=40$ months [45.3] vs. 76.2 [66.3], $p\leq.001$), and older at first incarceration ($M(SD)=22.7$ [8.0] vs. 18.1 [6.2], $p\leq.001$). ♀ more likely self-reported lifetime depression (35% vs. 23%, $p<.05$). ♀ more likely used drugs with partner (76% vs. 54%, $p\leq.001$) and parents (41% vs. 22%, $p\leq.001$), and got drunk with parents (61% vs. 47%, $p<.05$). <u>Pre-prison primary outcomes:</u> Genders differed on primary drug categories ($\chi^2=10.55$, $df=4$, $p=.03$); ♀ more likely consumed stimulants (cocaine/methamphetamine)(31% vs. 20%, $p<.05$). ♂ more likely used cannabis (30% vs. 14%, $p<.05$). ♂ more likely consumed alcohol in 6-months pre-index incarceration (63% vs. 39%, $\chi^2=14.66$, $df=1$, $p<.001$). <u>Intervention outcome:</u> <u>Primary drug use:</u> Despite reporting 'harder' primary drugs, ♀ less likely used primary drug at each month post-release (after controlling for pre-prison primary drug category/usage frequency). <u>Alcohol use:</u> After controlling for differences in baseline alcohol use frequency, ♀ gender predicted reduced likelihood of alcohol use at each month post-release. The interaction between gender/intervention was also significant; CBM had larger reduction in alcohol use for ♀ (29% [controls]/5% [CBM participants] used vs. 47% [controls] vs. 39% [CBM]).
Group D <u>Gordon et al. (2014)</u> US, randomised clinical trial	Inmates heroin-dependent pre-incarceration with 3-9-months remaining in-prison and meeting criteria for buprenorphine treatment randomly assigned by block randomisation within gender to 1 of 4 treatment conditions. $N=211$ (♂=148, ♀=63).	<u>Demographics ($p<.05$):</u> Independent of treatment condition, ♀ more likely had prior drug treatment ($\chi^2=10.7$; 95.2% vs. 76.4%), methadone maintenance treatment ($\chi^2=37.7$; 61.9% vs. 18.9%), and buprenorphine treatment ($\chi^2=12.5$; 28.6% vs. 9.5%). ♂ younger at first crime ($T=2.3$; $M=13.1$ vs. 15.2), first heroin use ($T=2.3$; 18.7 vs.

<i>Travers & Mann (2018)</i> UK, retrospective cohort study	$M(SD)$ age=39.08 (8.8). <u>Intervention 1</u>: Buprenorphine in-prison + community Opioid Treatment Program (OTP)($n=52$; ♂=37, ♀=15). <u>Intervention 2</u>: Buprenorphine in-prison + Community Health Centre (CHC) ($n=52$; ♂=35, ♀=17). <u>Intervention 3</u>: Counselling in-prison + initiation of OTP buprenorphine ($n=54$; ♂=38, ♀=16). <u>Intervention 4</u>: Counselling in-prison + initiation of CHC buprenorphine ($n=53$; ♂=38, ♀=15). Offenders with a community/suspended sentence order or released from prison between April 2008-March 2009 with completed OASys (Offender Assessment System), and if 2-year follow-up reconviction data available (risk measured via Offender Group Reconviction Scale (OGRS3). $N=110,133$ (♂=95,346, ♀=14,787). M age: ♂=31, ♀=32.	20.7), first arrest ($T=4.3$; 17.1 vs. 22.6), and first incarceration ($T=4.4$; 19.6 vs. 24.3). ♀ younger at baseline assessment ($T=-2.3$, $M=37.0$ vs. 40.0). ♀ more likely White (39.7% vs. 19.6%); ♂ more likely African American (76.4% vs. 55.6%)($X^2=9.7$). <u>Completed prison treatment</u>: ♀ more likely completed prison treatment (85.7% vs. 52.7%, $p<.001$). <u>Criminogenic risk factors ($p<.001$)</u>: Recent binge drinking more pertinent need for ♂ (45% vs. 41%, $phi=-.03$), along with problematic drinking (41% vs. 37%, $phi=-.03$). Class A drug misuse more relevant risk need for ♀ (29% vs. 24%, $phi=.04$). The authors report several findings without indication of significance level.
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Quality of Included Studies

The review's studies were assessed, in general, as moderate quality (Table 2). Biases and sample size issues were regular limitations, which increases the likelihood of type II errors. Self-report biases (over-reporting, under-reporting, and recall) were commonplace, which may be especially germane for offenders with longer histories and incarcerations. Geographic-related generalisability issues due to specific settings were another shortcoming. Furthermore, potential selection biases limited generalisability, especially relevant with treatment samples, which included many prison-based drug interventions ($n=8$) where the risk of potential selectivity of prisoner attributes limits generalisability to the larger prison population (Staton-Tindall et al., 2007).

Most studies employed cross-sectional and cohort methodologies. Cross-sectional designs, used to determine prevalence rates, may not be representative, and precludes

distinguishing between cause and effect. Biases may result due to attrition risks inherent in cohort studies (e.g. Lapham et al., 2000).

Several studies had decent-sized samples. Although 3 studies had more female participants (Lapham et al., 2000; Lapham et al., 2001; Messina et al., 2003), studies' female samples were usually smaller vis-à-vis their male counterparts ($n=16$). As Light et al. (2013) highlight, the relatively small women's samples are representative of the relative size of the female prison reception population; this can limit the studies' power. Moreover, some female samples might be too small to detect gender differences of a smaller magnitude. This may be especially pertinent to three studies, where women were under-represented comparative to the review's female ratio, as above (17.51%): Brown et al. (2012) ($n=19$; 10.33%), Light et al. (2013) ($n=132$; 9.20%), and Travers and Mann (2018) ($n=14,787$; 13.43%).

Ancillary deficiencies included not providing data (Messina et al., 2007), incomplete reporting of statistics such as p -values (Pelissier, 2004; Travers & Mann, 2018) (for the latter, the researcher requested the full report from the authors and the Ministry of Justice but it was unforthcoming), exact percentages (Kinner et al., 2013), and degrees of freedom (Langan & Pelissier, 2001; Pelissier, 2004). Other publications presented contradictory values (Light et al., 2013; Zlotnick et al., 2008a), incorrect values (e.g. $p=.000$; Butler et al., 2003) or referred the reader to a 'parent' study for methodological information (Brown et al., 2012; Gordon et al., 2013; LaPlante et al., 2008; Pelissier, 2004). Moreover, one study carelessly referenced the parent study as the DSM-III (Pelissier, 2004).

Table 2
Quality of included studies

	RCT design	Experimental design	Quasi-experimental design	Assignment to treatment groups truly random	Participants blinded to treatment allocation	Allocation to treatment groups concealed from allocator	Outcomes of participants who withdrew described and included in analysis	Those assessing the outcomes blind to the treatment allocation	Control and treatment groups comparable at entry	Groups treated identically other than for the named interventions	Outcomes measured in the same way for all groups	Outcomes measured in a reliable way	Appropriate statistical analysis used
Group A													
Brown et al. (2012)	+	N/A	N/A	+	+	+	-	+	+	+	+	+	+
Lapham et al. (2000)	N/A	N/A	+	N/A	N/A	N/A	+	N/A	N/A	N/A	+	+	+
Lapham et al. (2001)	N/A	N/A	+	N/A	N/A	N/A	+	N/A	N/A	N/A	+	+	+
LaPlante et al. (2008)	N/A	N/A	+	N/A	N/A	N/A	+	N/A	N/A	+	+	+	+
Group B													
Butler et al. (2003)	N/A	N/A	+	N/A	N/A	N/A	+	N/A	N/A	+	+	+	+
Gordon et al. (2013)	N/A	+	N/A	?	?	?	+	?	N/A	+	+	+	+
Kinner et al. (2013)	N/A	N/A	+	N/A	N/A	N/A	-	N/A	N/A	+	+	+	+
Langan & Pelissier (2001)	N/A	N/A	+	N/A	N/A	N/A	+	N/A	N/A	+	+	+	+
Light et al. (2013)	N/A	N/A	+	N/A	N/A	N/A	+	N/A	N/A	+	+	+	+
Messina et al. (2003)	N/A	N/A	+	N/A	N/A	N/A	N/A	N/A	N/A	+	+	+	+
Messina et al. (2007)	N/A	N/A	+	N/A	N/A	N/A	-	N/A	N/A	+	+	+	+
Pelissier et al. (2003)	N/A	N/A	+	N/A	N/A	N/A	+	N/A	+	+	+	+	+
Pelissier (2004)	N/A	N/A	+	N/A	N/A	N/A	-	?	?	+	+	+	+
Staton-Tindall et al. (2007)	N/A	N/A	+	N/A	N/A	N/A	+	N/A	N/A	+	+	+	+
Zlotnick et al. (2008a)	N/A	N/A	+	N/A	N/A	N/A	+	N/A	N/A	+	+	+	+
Group C													
Cobbina et al. (2012)	N/A	N/A	+	N/A	N/A	N/A	N/A	N/A	N/A	+	+	+	+
Johnson et al. (2011)	N/A	+	N/A	+	-	?	-	?	+	+	+	+	+
Group D													
Gordon et al. (2014)	N/A	+	N/A	+	?	-	+	?	N/A	+	+	+	+
Travers & Mann (2018)	N/A	N/A	+	N/A	N/A	N/A	-	N/A	N/A	+	+	+	+

Key

- +
 -
 - ?
 - N/A
- Low risk of bias
High risk of bias
Unclear risk of bias
Item not applicable

Narrative Summary

As above-mentioned, the heterogeneity of the studies necessitated a qualitative method to data synthesis and evaluation of outcomes. The studies' variables regarding gender differences were categorised, and are summarised below.

Demographics:

Age

Three papers described gender-related age differences. All reported male offenders were older than their female counterparts. These differences may be reflective of the substance studied as two reports were related to opioid-dependent offenders (Gordon et al., 2013, 2014). Only one was not substance-specific (Langan & Pelissier, 2001).

Education

Four studies reported education-associated gender differences. As all four originated from the US, education is operationalised corresponding to high-school or mean years. Three studies found women were more poorly educated (Gordon et al., 2013; Langan & Pelissier, 2001; Pelissier et al., 2003). The single study describing men as lesser educated involved DUI offenders electing therapy (LaPlante et al., 2008), hence this variation may be an effect of offence severity given the other three samples involved federal prisoners.

Marital Status and Relationships

Two studies discovered gender differences regarding offenders' marital status. Lapham et al. (2001) found women were more likely divorced, separated, or widowed; LaPlante et al. (2008) reported women as less likely married.

Five studies broadly reported relationships. One study found men more likely had incarcerated family (Messina et al., 2007). Females were described less likely living with a spouse/partner (Johnson et al., 2011). Two studies found female prisoners more likely had a spouse with a drug problem (Langan & Pelissier, 2001; Pelissier et al., 2003). One of these (Langan & Pelissier, 2001) further stated women more likely had a close friend with a substance issue. Johnson et al. (2011) reported women more likely used drugs with their partner, and parents, and got drunk with parents.

Children

Three studies mentioned gender differences concerning offenders' children. One found male prisoners more likely to have children (Messina et al., 2003) although another found women were more likely (Johnson et al., 2011). Johnson et al. (2011) also noted women pre-incarceration had a higher likelihood of living with their children, and Langan and Pelissier (2001) found females more likely self-reported plans post-release to live with their children. These were comparable studies with drug-using prisoners and good-sized samples, and so the rationale for the discrepancy is not evident.

Housing

One study reported gender differences concerning housing with women found more likely homeless in the previous six-months (Zlotnick et al., 2008a).

Employment and Income

Seven studies investigated employment and income-related gender differences; all found women were more disadvantaged. Three studies focussed on income, reporting women's earnings as less than men's (Lapham et al., 2001; LaPlante et al., 2008; Messina et al., 2003).

Five studies reported employment, all finding women more disadvantaged. Two of these specified a time parameter. In Gordon et al.'s (2013) study, males were found to have greater levels of legitimate employment in the past 30-days and past 3-years. Zlotnick et al. (2008a) reported women less likely worked in the past six-months. The other three studies reported no specific time boundary apart from pre-custody. Messina et al. (2003) found men were more likely employed, reporting their employment as their main financial support source. Pelissier et al. (2003) and Johnson et al. (2011) reported women as less likely employed.

It is recognised these figures do not indicate occupation type, and relate to legal employment and earnings. Illegal income can be gained several ways including begging, drug-dealing, prostitution, and undeclared earnings while falsely claiming benefits; female offenders are disproportionately likely to report prostitution (Holloway & Bennett, 2007), for example, and so these findings may not provide an accurate representation of earnings *per se*.

Ethnicity

Four studies noted ethnicity differences. LaPlante et al. (2008) and Gordon et al. (2014) reported women more likely White, although Langan and Pelissier (2001) found this with men. Gordon et al. (2013, 2014) noted African American participants were more likely male.

Physical Health:

Two studies investigated gender dissimilarities about physical health aspects. Langan and Pelissier (2001) reported females more likely rated their physical health negatively.

Gordon et al. (2013) found women had more lifetime medical problems, and more sexual partners in the 30-days pre-incarceration.

Mental Disorder:

Eight studies reported on mental disorder, described below by their central emphases.

Substance-Related

Three papers investigated substance-related disorders, each with DUI offenders.

Lapham et al. (2001) found more males had AUDs. LaPlante et al. (2008) reported more women had a lifetime alcohol dependence history wherein more men had lifetime histories of alcohol and drug abuse. Regarding past-year diagnoses, LaPlante et al. (2008) similarly noted women's preponderance for alcohol dependence, with men experiencing greater levels of past-year alcohol abuse. These lifetime differences held after analyses controlled for demographic variables ($p < .05$), and for all past-year disorders apart from alcohol abuse. Males in Cobbina et al.'s (2012) paper had higher incident rates of alcohol abuse.

Mood Disorders

Of the studies reporting gender differences related to mood disorders ($n=7$), all found women with higher levels. Five studies explored depressive disorders. Langan and Pelissier (2001), Johnson et al. (2011), Pelissier et al. (2003), and Zlotnick et al. (2008a) found women more likely had lifetime depression whilst Messina et al. (2007) found women had higher TSC-40-related (Trauma Symptom Checklist-40) depression scores.

Four studies investigated anxiety. Staton-Tindall et al. (2007) reported higher anxiety scores for women. Zlotnick et al. (2008a) noted more women had 'any anxiety

disorder', and 'any affective disorder'. LaPlante et al. (2008) observed women more likely had lifetime and past-year GAD, and bipolar I or II, which were maintained following controlled analyses ($p<.05$). Messina et al. (2007) reported women had greater TSC-40-related anxiety scores.

Personality Disorder

Zlotnick et al. (2008a) reported men had higher ASPD rates but more women had BPD.

Other

Zlotnick et al. (2008a) found women reported a greater amount of lifetime suicide thoughts/feelings/attempts, more likely had an eating disorder, and had higher Internalising Disorder Screen scores. Messina et al. (2007) noted women had higher TSC-40-related dissociation, sleep disturbance, sexual problems, and sexual abuse trauma index scores.

Addiction-Related Disorders

LaPlante et al. (2008) considered the degree of comorbidity with addiction-related disorders; male DUI offenders more likely had a lifetime addiction only history (i.e. alcohol, tobacco, drug, gambling addiction) but no other psychiatric problems, whereas more women reported a history of addiction-related disorders with three or more disorders. Regarding the extent of past-year psychiatric comorbidity, the investigators described men more likely had no past-year disorder or an alcohol-related disorder only. Women were found more liable to substance-related or gambling with one disorder, two disorders, or three or more disorders. Following regression analyses controlling for demographic variables, women continued to show more extensive lifetime and past-year comorbidities ($p<.05$).

Trauma:

Five studies found trauma-related gender differences; all noted women had higher rates of suffering. One concerned PTSD. LaPlante et al. (2008) reported women's greater levels of lifetime and past-year PTSD. Five authors noted historic abuse prevalence was higher for women. Women more likely experienced past physical abuse (LaPlante et al., 2008; Messina et al., 2007), past emotional abuse/neglect and sexual abuse (Messina et al., 2007), adulthood sexual and physical abuse (Messina et al., 2003), and lifetime physical and sexual abuse (Gordon et al., 2013; Langan & Pelissier, 2001). Messina et al. (2007) reported women more likely experienced five or more ACEs before age 16, continued sexual abuse beyond the age of 16, and had higher global TSC-40 scores, which increased as ACEs increased.

One study also found more women were raised in homes where drug use present (Langan & Pelissier, 2001) whereas another stated men more likely reported parental substance abuse (Messina et al., 2007).

Substances:

Twelve studies considered substance-related gender differences, distinguishing between substance types. Given its unique practice, IDU is considered separately.

Alcohol

Five studies discovered men had more problematic drinking. Travers and Mann (2018) stated more men reported binge and problematic drinking, Light et al.'s (2013) findings indicated males more likely drank in the year and four-weeks pre-detention, and Johnson et al. (2011) reported men more likely consumed alcohol in the six-months

pre-index imprisonment. Furthermore, Butler et al. (2003) found women more likely reported 'safe' AUDIT drinking levels, and Zlotnick et al. (2008a) reported women less likely drank daily in the past six-months.

Illicit Drugs

Class A

Heroin

Five studies specifically cited heroin consumption-related gender differences. Langan and Pelissier (2001) found women more likely used heroin daily, and Light et al. (2013) reported more females ever used. Butler et al. (2003) described in the 12-months pre-imprisonment, women more likely ever or regularly used heroin. Contrastingly, Gordon et al. (2013) found males used heroin more days in the 30-days pre-incarceration, and were twice more likely to use heroin during the index incarceration than females. This disparity may be due to sampling biases, as Gordon et al.'s (2013) participants were selected due to their heroin-dependent status pre-incarceration. This fits with two other studies' findings: men were younger at first heroin usage (Gordon et al., 2014), and of in-prison heroin users, more men used for the first time in-prison (Light et al., 2013).

Cocaine/Crack

Five publications investigated cocaine/crack; all reported women more likely used. Langan and Pelissier (2001) found more women engaged in daily cocaine use, Butler et al.'s (2003) findings suggested more women either ever used or regularly consumed cocaine, Light et al. (2013) reported females more likely ever and during the year pre-detention used crack, and Messina et al. (2003) reported women more likely used

crack/cocaine daily in the 60-days pre-custody. Johnson et al. (2011) noted women more likely self-reported stimulant (cocaine/methamphetamine) use pre-imprisonment.

Methadone

Butler et al. (2003) detailed methadone use, reporting more women ever or regularly used prescribed methadone, or ever or regularly used non-prescribed methadone. Furthermore, women more likely used non-prescribed methadone in-prison.

Morphine

Butler et al. (2003) solely reported on morphine use, finding women more likely ever used it.

Class A/B/C

Four studies described women's preponderance to use Class A drugs although the explicit substance is unclear due to ambiguous reportage. Messina et al. (2003) found women more likely used 'opiates' daily in the 60-days pre-custody, Pelissier et al. (2003) noted women prisoners more likely used 'hard' drugs in the year before the most recent arrest, Travers and Mann (2018) stated Class A drug misuse was a greater risk need for women, while Light et al. (2013) reported women used Class A drugs only in the four-weeks pre-custody. Light et al. (2013) additionally reported more men used Class B and/or Class C only.

Class C

One study reported gender differences regarding cannabis use with men having higher rates pre-imprisonment (Johnson et al., 2011).

Non-specific

Two papers noted gender differences but did not indicate the drug type. Langan and Pelissier (2001) reported women more likely used drugs daily, and engaged in daily polydrug use. Cobbina et al. (2012) stated females more likely reported drug abuse.

IDU

Four studies investigated IDU, generally finding higher rates for women. Butler et al. (2003) reported women more likely engaged in past IDU (prison or community), with female gender associated with an increased risk of in-prison IDU. Gordon et al. (2013) found women had higher lifetime IDU rates, and Zlotnick et al. (2008a) reported women more likely injected drugs. Similarly, Kinner et al. (2013) found women more likely had a lifetime IDU history in Queensland and NSW. However, of those with a lifetime IDU history, lifetime in-prison IDU was more common in men in Queensland and NSW, including heroin, other opioids, and methamphetamine. In Queensland, men more likely reported a lifetime history of injecting opioids other than heroin whereas women more likely recounted a lifetime history of injecting cocaine. Regression analyses indicated an effect between gender and jurisdiction ($p=.002$) with this observed gender difference of in-prison IDU higher in Queensland than NSW. A possible reason for this nuance may be a reduced supply of injectable drugs for females as they are less likely to receive visits from partners in Queensland, limiting women's opportunities to be influenced by male partners given research demonstrates relationships with men impact on women's drug practices (Johnson et al., 2011).

Quantity

One study quantified usage; Light et al. (2013) reported women spent more on heroin per day of those using in the four-weeks pre-imprisonment.

Motivation for Using

Gender differences concerning motivations for using were reported in one publication. Langan and Pelissier (2001) found male prisoners cited hedonistic reasons for using whilst women more likely used drugs to lessen physical or emotional pain.

Offending:

Fourteen studies reported gender variations regarding offending characteristics, sub-categorised below.

Type

One report investigated offence type; Zlotnick et al. (2008a) found women less likely ever committed assault.

Number of Arrests/Convictions

Four studies investigated differences in arrest/conviction rates with the results indicating this was higher in men. Lapham et al. (2001) found women less likely had three or more prior DWIs, and LaPlante et al. (2008) reported women had fewer DUI arrests overall. Two studies discovered men had more lifetime arrests (Johnson et al., 2011; Messina et al., 2003). These findings suggest men's more extensive forensic histories relative to women transcend offence severity and substance type given the

first two studies concerned impaired drivers whilst the latter two involved drug-using prisoners.

Imprisonment

Five studies explored differences regarding custody imprisonment periods. Men had higher rates (Langan & Pelissier, 2001; Pelissier et al., 2003), and lengthier imprisonments (Zlotnick et al., 2008a; Messina et al., 2003; Johnson et al., 2011).

Substances Implicated in Offending

Two investigations specified gender differences regarding the interconnection between substances and offending. Butler et al. (2003) reported women were more likely intoxicated during the commission of the most serious offence for the current imprisonment. Light et al. (2013) discovered women more likely used illegal drugs when committing the offence(s), committed the offence(s) to get money for drugs, reported offending was always linked to their usage, and committed the offence(s) to support another's drug use.

Age at First Arrest/Crime/Imprisonment

Four studies considered age-related offending profiles. Males more likely initiated criminal activity at a younger age (Gordon et al., 2013, 2014), were younger when first arrested (Gordon et al., 2014; Johnson et al., 2011; Messina et al., 2003), and younger at first incarceration (Gordon et al., 2014; Johnson et al., 2011).

Recidivism

Three papers reported gender-related recidivism differences. Males more likely reoffended (Lapham et al., 2000) but were less likely if they lived with a spouse post-release (Pelissier et al., 2003). Cobbina et al. (2012) reported females with drug use histories recidivated more quickly.

Criminal Thinking (CT)

Staton-Tindall et al. (2007) found men had higher CT scores on all CJ-CEST subscales, including entitlement, justification, power orientation, cold-heartedness, criminal rationalisation, and personal irresponsibility.

Treatment:

Ten reports observed treatment-related gender differences. Most centred on drug treatment although mental health and intervention efficacy also featured, with women faring better.

Substance-Related

Seven studies explored substance misuse treatment. Women more likely expressed motivation for or pursued treatment (Butler et al., 2003; Gordon et al., 2013; Kinner et al., 2013; Light et al., 2013). One publication reported women more likely had prior treatment, and completed the in-prison intervention under investigation (Gordon et al., 2014). Women with good family ties more likely entered treatment whereas women with a moderate-severity offence were less likely (Pelissier, 2004). Staton-Tindall et al. (2007) found females reported higher CJ-CEST treatment engagement scores including counsellor rapport and treatment participation.

Mental Health

It was found women more likely received treatment for psychological problems (Gordon et al., 2013; Pelissier et al., 2003) including psychiatric hospitalisations (Zlotnick et al., 2008a). Women who received treatment less likely consumed drugs post-release (Pelissier et al., 2003).

Efficacy

Men improved more at follow-up regarding change in percentage of risky drinking days (Brown et al., 2012) although this should be interpreted cautiously due to the relatively small proportion (10%) of female participants.

Discussion

Main Findings

The results from this review afford new information about gender differences in substance-using offenders, which, as documented earlier, is an under-researched field with studies conducted in recent years investigating a limited range of women's issues. The studies were systematised contingent on the paper's emphasis. This comprised impaired drivers, prisoners, offenders at large in the community, and prisoners freed to the community. This organisation did not yield any meaningful intergroup differences due to the small number of studies in each category.

The review revealed important demographic gender differences concerning age, education, relationships, and employment and income. Regarding age, men were found to be older. This finding held for the two studies that were substance-specific, focussing on opioids (Gordon et al., 2013, 2014); however, more significantly, Langan and Pelissier (2001) reported the same result for their larger sample ($N=1,644$), which investigated different substances. This latter, larger-scale study was assessed as a higher quality study vis-à-vis Gordon et al. (2013, 2014), strengthening the credence of the finding that substance-using male offenders are more likely to be older than their female counterparts.

For education, women largely received less schooling than men, borne out of three moderate to high quality studies (Gordon et al., 2013; Langan & Pelissier, 2001; Pelissier et al., 2003). Another noteworthy demographic-related outcome concerned the significance of relationships particularly for females. Women were found more likely to have a partner or close friend with substance misuse issues, and to have used with partners and parents (Johnson et al., 2011; Langan & Pelissier, 2001; Pelissier et al., 2003). The high quality of the latter two studies especially supports the reliability of the results. The review also found that women more than men were disadvantaged concerning employment/income with higher levels of unemployment, and lower income levels (Gordon et al., 2013; Johnson et al., 2011; Lapham et al., 2001; LaPlante et al., 2008; Messina et al., 2003; Pelissier et al., 2003; Zlotnick et al., 2008a).

Another key finding of the review related to well-being. Women more likely self-rated their physical health negatively with additional medical problems compared to men. Women as well fared worse concerning mental health with seven studies concluding women are more likely to have higher rates of anxiety, and depressive disorders. ASPD was higher in males whilst BPD was more usual in females. Moreover, the review found women had experienced more trauma than men. The supporting studies were of moderate or high quality (Gordon et al., 2013; Johnson et al., 2011, Langan & Pelissier, 2001; LaPlante et al., 2008; Messina et al., 2003; Messina et al., 2007; Pelissier et al., 2003; Staton-Tindall et al., 2007; Zlotnick et al., 2008a); hence contribute credible evidence to the existing literature (as outlined in Chapter 1) yet extends this to an offending population.

Langan and Pelissier (2001) reported on motives for using, finding that female offenders cited self-medication reasons whilst men conveyed hedonistic reasons. Although this was the sole study focussing on this specific aspect, the research was of high quality with a large sample size so is a credible key finding. Together with the

review's outcome that female substance-using convicted offenders have higher rates of trauma, this suggests the stronger association for women between trauma and substance misuse for self-medication purposes, as outlined in Chapter 1, can be extended to an offending population.

Although there was a greater likelihood of men affected by alcohol abuse diagnoses and women alcohol dependence, regarding general alcohol consumption, males more likely reported riskier levels. Concerning illicit substances, differences in heroin use varied with sample; rates were higher for women mostly, including daily spend, although in pre-incarceration heroin-dependent prisoners, males were found to have greater usage, hence may reflect sampling biases. Regarding other illicit drug usage including cocaine/crack, methadone, morphine, opiates, 'hard' drugs, polydrug, and IDU, women were found with greater levels. This important finding was further supported by two papers that did not report on specific substances. Langan and Pelissier's (2001), and Cobbina's (2012) research, both of high quality and with good-sized samples, found females vis-à-vis males had higher using rates. One study examined cannabis use, and this was the sole illegal drug men more likely used (Johnson et al., 2011).

Concerning offending characteristics, the main finding arising from the review was that males had a greater likelihood of having more arrests and convictions, had higher imprisonment rates and longer periods in custody, and were younger at the time of first arrest, crime, or imprisonment (Gordon et al., 2013, 2014; Johnson et al., 2011; Langan & Pelissier, 2001; Lapham et al., 2001; LaPlante et al., 2008; Messina et al., 2003; Pelissier et al., 2003; Zlotnick et al., 2008). This finding is deemed reliable as was synthesised from studies assessed as moderate to high quality. Furthermore, although only two papers reported gender differences regarding offending where substances were implicated (Butler et al., 2003; Light et al., 2013), both reported women had a greater likelihood.

Less consensus was discovered concerning recidivism. One study found females more likely reoffended if they had a drug use history (Cobbina et al., 2012), wherein another found men older than 31-years-old more likely recidivated (Lapham et al., 2000); Lapham et al.'s (2000) research was DUI-focussed so their finding may reflect a predisposition concerning less serious offending, especially given Pelissier et al. (2003) found male prisoners were less disposed to reoffending if they cohabitated post-release.

Another noteworthy conclusion of this review concerns treatment. Women were usually observed to have higher rates of motivation for, receiving, and completing drug or mental health treatment vis-à-vis men, and, if engaged in therapy, less likely used substances following release than their male counterparts (Butler et al., 2003; Gordon et al., 2013, 2014; Kinner et al., 2013; Light et al., 2013; Pelissier et al., 2003; Zlotnick et al., 2008). Again, the moderate to high quality of these papers strengthens this finding's credibility.

Implications

The variations related to gender found in this review highlight three vital and interdependent problems especially germane for female offenders: mental disorder, substance misuse, and trauma, and resonate with recent criticisms heralding women offenders' special needs. Despite this, administering male-oriented programmes to women has been the standard correctional practice (Langan & Pelissier, 2001). Although the review's studies emanated primarily from the US with limited studies elsewhere, this too is UK custom (Public Health England, 2018). Furthermore, the empirical support for the existence of women's distinct needs has traditionally relied on prisoners who are not in treatment, and treatment participants who are not imprisoned;

these are two inappropriate samples and may not be generalisable to prisoners in treatment (Langan & Pelissier, 2001). The review's specified inclusion criteria of convicted drug-using offenders endeavoured to minimise some of these generalisability issues.

The review's findings have important implications for treatment. Traditionally, issues relating to mental disorder, substance misuse, and trauma have been treated discretely. An integrated approach could increase treatment efficacy, resulting in improvements in outcomes such as programme retention, relapse, and recidivism (Langan & Pelissier, 2001). Differences in treatment outcomes may also be more a consequence of differences in treatment processes instead of initial differences in amount and severity of life problems, as can be assumed, and so it is important to ensure robust programming (Pelissier et al., 2003).

Given the finding that men's and women's reasons for consuming drugs appear to differ, this implies that the genders may need different treatment approaches. Generally, whereas men's therapy is normally structured around techniques to increase and strengthen self-control, therapy for women may need to concentrate on improving their sense of well-being (Langan & Pelissier, 2001). Additionally, the greater levels of trauma experienced by women, including ACEs, compared to men could suggest another distinction for therapeutic practice; since men's treatment plans tend to concentrate on the risks to self and family of using, this emphasis can be harmful to women with histories of depression combined with low self-esteem, both of which can result from ACEs (Langan & Pelissier, 2001).

Moreover, the review's results suggest an important confluence between relationships and substance use for female offenders particularly. Female offenders were found less likely to be cohabitating, and more likely to associate and use with drug-using family,

friends, or partners. It is thus important to ensure interpersonal relationships, especially with partners, and issues arising from them, are addressed as part of treatment for women.

Limitations

One main limitation of this systematic review is the limited range of studies available for inclusion ($N=19$). This is due to the overall paucity of research in the area of gender differences with drug-using offenders over the last 20 years. The lack of previous studies necessitated a broad research question to capture all the research.

An additional shortcoming is that one study had markedly large participants ($N=110,133$; Travers & Mann, 2018), which encompasses 80.47% of the review's sample; this skews the overall numbers contained in the review. Men were over-represented in most papers ($n=16$), which may reduce their power in detecting women's differences especially. This disparity reflects the general global criminal justice and penal systems position, and the difficulty recruiting female prisoners to research; women comprise between 2-9% of the total prison population in approximately 80% of prisons worldwide (Messina et al., 2003; Walmsley, 2017), and are regularly offered other, competing treatment opportunities (Gordon et al., 2014). However, compared to these figures, it could be argued women were over-represented in the review as they comprised 17.51% of the sample.

It is also important to recognise the US is the source country for the majority of the review's publications ($n=14$; 73.68%). This is likely a manifestation of the US having the world's highest female prison population rate with about 65.7 per 100,000 of the national population vis-à-vis other countries included: Australia (13.6), UK (England

and Wales) (6.7), and Canada (7.7) (Walmsley, 2017). Therefore, it is essential future studies comprise geographically diverse samples to assure data do not reflect the idiosyncratic patterns of drug use in a single locale (Langan & Pelissier, 2001).

Another limitation is that due to the nature of the studies, the review is unable to identify if offenders were under the influence of drugs at the time of the index offence. Of note, only two studies investigated this aspect (Butler et al., 2003; Light et al., 2013). This hampers an understanding of the drugs-offending relationship.

Future research should have well-defined variables, including clearly naming substances. Using terminology such as 'hard' and 'soft' drugs is ambiguous, and has no pharmacological, posological, or legal validity. Although used to distinguish dangerousness, it is mostly a value judgement utilised by pro- and anti-drug factions for propaganda reasons, hence should be avoided. Also, it is unclear if the terms DUI and DWI referred to the same or different offence type, as meanings are contingent on US state. Often one represents alcohol and the other drug intoxication, alternating from state-to-state. Furthermore, the concepts of sex and gender pose a methodological problem. They are regularly used interchangeably though sex is biologically determined, and gender is socially created. This approach denies different drugs' properties have different physiological effects.

Finally, as noted earlier, the Cochrane Collaboration does not recommend a particular tool to assess risk of bias. Although it is recognised a single instrument is not practicable for all reviews, there is scope for more consistency to ensure accurate measurement. Indeed, a recent systematic review of the content and measurement properties of existing tools found several limitations regarding their guidance, capacity, and measurement properties (Page, McKenzie, & Higgins, 2018). The development of a new, reliable, and comprehensive tool is urged.

Conclusions

Although substance misuse is recognised as a compelling risk factor for female offenders, research has mostly been male-dominated (Andrews et al., 2012; Holloway & Bennett, 2007). The main aim of this systematic review was to examine the evidence base concerning gender-related variations in offenders who used alcohol and/or illegal drugs, and explore the characteristic differences. Identifying gender differences fulfils an important gap in knowledge, towards an improved understanding to ensure interventions are gender-responsive (LaPlante et al., 2008). To achieve this, the literature related to gender and substance use in convicted offenders was scrutinised. Employing a systematic review procedure generated 472 documents. PICO inclusion and exclusion criteria were applied, followed by a quality assessment; subsequently 19 studies remained to review in-depth.

Notwithstanding the paucity of research, emerging from the 19 included studies were several gender-salient areas, as described earlier. The findings underscore the greater prevalence and marked interdependency of mental disorder, substance misuse, and trauma for female offenders. This stresses the importance of detailed psychiatric assessments for women offenders, and indicates the need for integrated gender-specific, trauma-informed treatment. Given that drug-using female offenders must attend to distressing, co-occurring disorders, further research needs to address the aetiological, therapeutic, and organisational implications of gender differences in these areas (Zlotnick et al., 2008a). Moreover, it will be essential that any changes implemented regarding treatment, which depart from those usually delivered to men, are evaluated to determine if the modifications lead to increased efficacy regarding treatment entry, retention, and post-treatment outcomes; hence the above-noted suggestions for delivering therapy to substance using female offenders are, at present, speculative (Langan & Pelissier, 2001).

CHAPTER 3

CRITIQUE OF THE TRAUMA SYMPTOM INVENTORY-2

Introduction

As noted in Chapter 1, trauma is defined as a distressing event, experienced as harmful or life-threatening, with its impact exceeding the person's resources to cope. Given its link with offending, and mental disorder (Pickard & Fazel, 2013), trauma is of high significance for forensic psychology practice. The Trauma Symptom Inventory-2 (TSI-2; Briere, 2011) is one measure used in the quantitative study presented in Chapter 4 to assess current trauma-related psychological sequelae in high-risk MDOs who had experienced past trauma and consumed substances.

Standardised tests to assess the wide-ranging symptoms and problems associated with trauma are scant with clinicians reliant instead upon non-normed measures, a battery of tests more narrowly defined, or a clinical interview (Godbout, Hodges, Briere, & Runtz, 2016). Correspondingly, the Trauma Symptom Inventory (TSI; Briere, 1995) was created as an alternative to offer a standardised and validated measure that evaluates acute and chronic traumatic symptomatology but also broader posttraumatic disturbance, which includes symptoms beyond those of PTSD. It is widely-used and well-validated (Gambetti, Bensi, Nori, & Giusberti, 2011; Runtz & Roche, 1999; Snyder, Elhai, North, & Heaney, 2009).

Item and scale updates of the TSI were ultimately needed, particularly to better evaluate symptom exaggeration (Palermo & Brand, 2019); hence the TSI revised its items and scales, and re-normed commensurate with the current general population, resulting in the TSI-2 (Briere, 2011; Godbout et al., 2016). The TSI-2 correlates well with the TSI, which will be demonstrated in this chapter.

Following is a critique of the TSI-2. This will comprise an overview of the tool, control group norms, its characteristics including reliability and validity, and with limitations considered throughout. The critique will conclude with implications for future practice and research.

Overview

The TSI-2 is intended to assess acute and chronic symptomatology related but not limited to experiencing adverse events, depicted in Figure 1 (Chapter 1), such as childhood abuse or neglect, sexual and physical assault, domestic violence, combat, torture, RTAs, medical trauma, mass casualty event, witnessing violence, and traumatic losses (Briere, 2011). The TSI-2 moreover measures psychological sequelae resulting from trauma exposure plus general psychological sequelae (e.g. mood disturbance, chronic interpersonal difficulties, and substance abuse).

While the TSI-2 was not expressly created as an outcome measure, a benefit of this second iteration is the inclusion of a Reliable Change Score index. This renders the TSI-2 amenable to be used as a pre- and post-treatment measure. The TSI-2's administration guidance usefully provides information on how to evaluate changes in symptomatology over time for each factor, scale, and subscale and if the changes demonstrate an improvement or worsening. The TSI-2 comprises accompanying appendices to gauge if there is any statistically or clinically significant change within a specified probability level (i.e. $p=.15$, $.10$, $.05$, or $.01$; Briere, 2011). The TSI-2 may thus be a useful outcome measure to use within forensic settings where risk assessment and management, and evaluating treatment efficacy are crucial.

The Instrument

The TSI-2 is a 136-item self-report measure, which assesses an extensive range of potentially complex symptomatology associated with trauma exposure covering PTSD, dissociation, and somatisation to insecure attachment styles, impaired self-capacities, and dysfunctional behaviours (Briere, 2011). The tool was principally aimed to be used within various clinical settings, and as it has been standardised on and includes separate norms for the genders, is suitable for men and women aged 18-years-old or over with a reading ability at fifth-grade level (i.e. 10-11-years-old) (Briere, 2011).

Within the test, participants are asked to rate the relative frequency of each item experienced in the past six-months on a four-point Likert scale ranging from 0 ('never') to 3 ('often'); the questions do not reference any specific trauma experienced. The TSI-2's items are, notably, distributed into the scales corresponding with the questions. To illustrate the TSI-2's item format, herein are three questions from the tool:

In the last 6-months, how often have you experienced?

(Item 45) Having angry thoughts

(Item 52) Intentionally overdosing on pills or drugs

(Item 69) Throwing or hitting things because you were out of control of your
feelings

Contained within the TSI-2 are eight 'critical items', which are designed to aid with the identification of issues that characterise more serious psychological disturbance or risk to the subject or others, alerting the clinician to investigate further (Briere, 2011).

Item 52, as above, is one example.

Following the test's completion, raw, *T*, and percentile scores are recorded onto a summary sheet, with *T* scores plotted onto a profile form, producing an overall trauma symptom profile, which is compared with the mean score of the standardisation sample. The TSI-2 standardisation sample (*N*=678) matched the US Census Bureau's demographics. Higher raw and higher *T*-scores deviating from the mean scores indicate the larger the extent of trauma-related symptomatology with *T*-scores ranging from 60 to 64 deemed 'problematic' (likely to have clinical implications), and scores at or above 65 regarded 'clinically elevated' (representing a significant clinical concern) (Briere, 2011).

The TSI-2 contains two validity scales, four factors, 12 clinical scales, and 12 subscales, which, along with a description of the area evaluated, are presented in Table 3.

Table 3^a
TSI-2 scales, subscales, and factors

Scale/subscale/factor	Domain evaluated
Validity scale	
Response Level (RL)	Bias towards under-reporting/denying symptoms
Atypical Response (ATR)	Bias towards over-reporting trauma-related symptom
Factor	
Self-Disturbance (SELF)	Difficulties associated with inadequate self-awareness and negative models of self/others
Posttraumatic Stress (TRAUMA)	Posttraumatic stress and associated anxiety and dissociation
Externalisation (EXT)	Tendency to engaged in self-destructive or dysfunctional behaviours when distressed
Somatisation (SOMA) ^b	Refer to SOM scale
Clinical scale/subscale	
Anxious Arousal (AA) Anxiety (AA-A) Hyperarousal (AA-H)	Anxiety and hyperarousal symptoms Symptoms of anxiety Posttraumatic hyperarousal-related symptoms
Depression (D)	Cognitive, affective or somatic symptoms of depression
Anger (ANG)	Angry thoughts, feelings, and behaviours

Intrusive experiences (IE)	Reliving/intrusion symptoms of posttraumatic stress
Defensive avoidance (DA)	Avoidance of upsetting thoughts, feelings, or memories
Dissociation (DIS)	Depersonalisation, derealisation, detachment, amnesia, identity splits
Somatic preoccupations (SOM) Pain (SOM-P) General (SOM-G)	Somatic preoccupation and distress Aches and pains Generalised somatic complaints
Sexual Disturbance (SXD) Sexual Concerns (SXD-SC) Dysfunctional Sexual Behaviour (SXD-DSB)	Sexual problems and behaviours Negative thoughts and feelings associated with sexuality Problematic sexual behaviours
Suicidality (SUI) Ideation (SUI-I) Behaviour (SUI-B)	Suicidal thoughts and behaviours Suicidal ideation Suicidal behaviour
Insecure attachment (IA) Relational Avoidance (IA-RA) Rejection Sensitivity (IA-RS)	Difficulties or insecurities regarding close relationships with others Discomfort or avoidance re: close relationships Preoccupation with abandonment or rejection in relationships
Impaired self-reference (ISR) Reduced Self-Awareness (ISR-RSA) Other-Directedness (ISR-OD)	Difficulties in accessing identity, self, or self-determination Lack of awareness of internal mental processes associated with personal sense of self Overvaluing others' views and demands in the absence of sufficient self-reference
Tension reduction behaviour (TRB)	Use of external activities (e.g. self-injury, bingeing) as ways to avoid or distract from upsetting internal states

^aAdapted from the TSI-2 manual (Briere, 2011)

^bThe SOMA factor score is the same as the SOM scale score

Revisions

The TSI-2 represents a revision of the original TSI, which reflects new developments and research in the trauma field, affording continuity between the two. It provides additional scales for better symptom coverage, measuring symptom clusters not contained within the TSI, which is important given the multi-faceted nature of trauma symptomatology. In sum, 87 items (64%) are new or have been improved (Briere, 2011). The IA, SOM, and SUI are new clinical scales to this revision of the TSI-2, as are several subscales such as the AA-H, and ISR-OD whilst the four factors are either new to this version (i.e. EXT and SOMA) or reconfigured based on added or modified scales (i.e. SELF, and TRAUMA) (Briere, 2011).

The TSI-2 altered its validity scales. However, it needs to be borne in mind when administering the tool that although validity scales are useful, traumatised persons, perhaps by virtue of the atypical quality of some posttraumatic symptomatology, are inclined to score higher than others on negative impression scales even when not trying to malingering (Briere & Spinazzola, 2009). Regarding the amendments, the TSI-2 has reduced the number of validity scales from three to two relative to the first version's. The Inconsistent Response (INC) scale has been removed. This scale indicated the degree to which the individual responds to similar TSI items in a markedly inconsistent way compared with the general population (Briere, 1995).

The TSI-2 manual provides no rationale for eliminating the INC scale. Its relatively poor internal reliability ($\alpha=.51$) as per the TSI may be the reason. Nonetheless, its removal is concerning since a high INC score could be attributable to random responding, poor concentration, dissociative phenomena, or reading difficulties – all of potential relevance to the forensic population. The forensic practitioner therefore needs to be cognisant of these possibilities in advance of administering the TSI-2 to determine if they are contraindicated for the client experiencing trauma-related symptoms, who may require more time for stabilisation before participating with the assessment. Or, if related to intellectual disabilities, that appropriate adaptations are made to address responsivity issues. It may also be prudent to use an extra tool to assess for these.

Since the TSI-2 is relatively new, data on its psychometric characteristics are undeveloped regarding the revised ATR scale and especially the RL scale. With regards to the ATR scale, which assesses the tendency for overendorsement of trauma-related symptoms, it has been updated with new items to improve the detection of over-reporting generally but moreover, to better determine malingering of PTSD. This is

beneficial diagnostically given the requirement that malingering is ruled out when diagnosing PTSD, and from a forensic practice standpoint taking into consideration malingering is a particular concern in forensic settings (Merten & Rogers, 2017).

Although the manual states that a high ATR score could signal general overendorsement on all items, specific overendorsement of PTSD items, random responding inclusive of endorsement of seldom endorsed items, or very high levels of distress (Briere, 2011), and emphasises that specific conclusions regarding the reasons for an invalid ATR scale should be avoided, it does not provide the clinician with further guidance. A weakness of this scale may be its overemphasis on experiences of complex PTSD; hence the improved efficacy of the ATR scale is primarily focussed upon its ability at detecting malingered PTSD, and not overendorsement generally or its relationship to current elevated stress. The implications for this potential confounding of the ATR scale with experiences of complex PTSD is that it becomes hard to assess and differentiate feigned and genuine responding for particularly traumatised persons.

Initial research has indicated the revised ATR is superior to the original version (Gray, Elhai, & Briere, 2010; Palermo & Brand, 2019). This improves its potential value in clinical and forensic settings though it has been demonstrated the Personality Assessment Inventory's (PAI; Morey, 2007) Positive Impression (PIM) and Negative Impression (NIM) validity scales are superior at detecting malingerers (Gray et al., 2010); hence it may be pragmatic to employ other scales in conjunction with the TSI-2 if there are specific concerns about feigning of symptoms (Palermo & Brand, 2019).

Research regarding the TSI's ATR scale found the model best predicting invalid profiles comprised higher scores on Dissociation and Tension Reduction Behaviour (Nye, Qualls,

& Katzman, 2006). Tension reduction behaviour includes substance misuse, which, as Briere (1995) noted, can be associated with unusual experiences such as dissociation. However, research has produced inconsistent findings on the relationship between dissociation and substance misuse. To illustrate, a recent study demonstrated support for the 'chemical dissociation hypothesis', which posits that persons who abuse substances may not exhibit high levels of dissociation despite their trauma history because dissociative-like states are achieved through drug consumption instead (Somer, Altus, & Ginzburg, 2010) whilst other research has contradicted this finding (e.g. Najavits & Walsh, 2012).

It is plausible the disparity can be explained by different methodologies given the former study sampled Israeli male and female heroin addicts with a trauma history whilst the latter included only women with current PTSD and substance dependency. Regardless, although the chemical dissociation hypothesis accords with the self-medication hypothesis and research indicating PTSD and substance misuse may be mediated by negative emotionality (Miller, Vogt, Mozley, Kaloupek, & Keane, 2006; Somer et al., 2010), it provides a narrow explanation for how substance misuse relates to dissociation given that substances are used for numerous reasons, including accessing negative feelings instead of dissociating from them (Najavits, 2002). Further research is required to develop a more nuanced understanding of this relationship, along with improving the TSI-2's ATR scale, in order to help improve trauma-related suffering and decrease the 'revolving door' often observed in persons with comorbid substance misuse and mental disorder (Somer et al., 2010).

Derived from Gray et al.'s (2010) investigation was the ATR scale's recommended raw score cut-off of eight, which applies to 'normal' populations defined as the general population or non-clinically referred university students. However, it is noteworthy that

the study's sample was primarily Caucasian undergraduate psychology students from American Midwestern and Western states with a mean age of 19.5-years-old ($SD=2.84$); seventy-five were trained to simulate PTSD, whilst 49 had genuine PTSD symptoms. This may thus decrease the generalisability of the findings to different demographics including non-Western samples, and/or older persons.

Regarding forensic practice, the TSI-2 manual stipulates an ATR scale raw score cut-off of 15 is advocated for clinical and forensic samples, commensurate with other symptom inventories (Briere, 2011). The TSI-2 manual notes that this was applied with validation samples of incarcerated women ($N=125$), and a combined clinical validity (CCV) sample ($N=125$), which comprised subsamples of combat veterans ($n=32$), persons with a BPD diagnosis ($n=30$), victims of domestic violence ($n=31$), and individuals who had experienced sexual abuse ($n=32$). It is recognised the forensic cut-off validation samples did not include MDOs; hence this should be borne in mind when using the TSI-2 with this population as was the case with the research detailed in Chapter 4.

The other validity scale, the RL scale, is intended to detect underendorsement of trauma-related symptomatology. The manual notes it was purposely developed to determine when persons indiscriminately respond by marking zeros instead of refusing to complete the test (Briere, 2011). This is a rather narrow remit ascribed to the RL scale, which could also helpfully be used in forensic practice (e.g. immigration assessment to inform immigration court decision-making) because it offers information about a person's perception of their symptoms as well as their willingness to endorse or discuss symptomatology (Filone & DeMatteo, 2017). This is likewise conducive to good practice as could be used as a discussion point to engage with prisoners or MDOs; taking a collaborative approach provides foundation for establishing a positive

therapeutic rapport, and further enlightens risk assessment and formulation. However, it should be noted the eight items comprising the RL scale are included as they were shown unlikely to receive a zero rating in the normative sample. It is important future research is undertaken with other samples including persons with mental health issues, and offenders to reduce issues related to generalisability and reliability for the RL scale, bolstering its value.

Self-Report Measures

The TSI-2 is subject to the usual limitations inherent in self-report data. For example, respondents may be influenced, consciously or unconsciously, towards responding in a socially desirable or preferred way instead of being truthful; this may be especially germane in a forensic setting whereby positive behaviour is reinforced, and there are significant gains to be made for presenting as compliant and co-operative.

Furthermore, self-report measures are biased regarding introspective ability; again, this is acutely relevant to forensic patients where trauma and personality disorder diagnoses co-occur, correlated with negative self-perception and shame, which could undermine self-reflection. Moreover, another limitation with self-report measures is that question phrasing may be confusing or ambiguous for respondents. This may be moderated by the clinician reading aloud the questions as per the procedure heeded in Chapter 4's quantitative study.

Practical Considerations

The TSI-2 test entails an item booklet, professional manual, answer sheet, and scoring/profile forms, which advantageously is economical and easily available online. Furthermore, a computer scoring programme is obtainable for both Mac and Windows. Both the hard copy and computer formats are user-friendly with regards to administration and scoring, and produce the respondent's results in score report and graph forms, showing the relative level of current posttraumatic stress or further trauma-related sequelae. The change score report has comprehensible graphic representations to assist practitioners to ascertain if significant changes have happened across time.

Normative Data

The TSI-2 normative group comprised 678 men and women between 18-and 90-years-old from the general US population. Briere (2011) confirms the TSI-2 standardisation sample closely matched the US Census Bureau's demographics. Two multivariate analyses of variance (MANOVAs) were executed on the normative data to assess for the effect of gender, age, and race/ethnicity on nonstandardised TSI-2 factor, scale, and subscale scores. *Post-hoc* analyses of variance (ANOVAs) showed significant effects for gender (17.4%) and age (28.1%) but not for race/ethnicity (3.9%). Therefore, the TSI-2 derived discrete normative data for the genders and different ages but not for race/ethnicity.

It should be noted Briere (2011) does not define the terms race and ethnicity. He only reports the composition of the standardisation sample, which comprised Caucasians (73%), African Americans (11%), Hispanics (9%), or persons declaring 'other' (7%). The preponderance of Caucasians needs to be borne in mind when administering the TSI-2, as the standardisation sample may not be representative of ethnicities in other

regions, and hampers the TSI-2's generalisability to other non-Western cultures especially (Filone & DeMatteo, 2017).

The TSI-2 manual distinguishes other samples the tool was evaluated against concerning reliability and validity during development including two cohorts of university students ($N=1,051$, $N=477$), female prisoners ($N=125$), and the CCV sample ($N=125$). Again, like the standardisation sample, the CCV sample was primarily Caucasian (84%), and comparatively highly educated; hence differing demographically from that anticipated with a multi-ethnic sample (Filone & DeMatteo, 2017)

Moreover, Briere's CCV sample arguably differs from a distinctive MDO population. This has important implications for forensic practitioners delivering clinical care in correctional and secure hospital sites where issues associated with ethnicity are not just relevant but accentuated because of the higher proportion of ethnic minorities in these settings (Hicks, 2004). This shortcoming may bias the TSI-2's diagnostic abilities for MDOs, leading to erroneous formulations and guiding treatment.

In addition to the CCV, of relevance to forensic practice especially are the standardisation samples for female prisoners. However, the relatively small sample sizes undermine the TSI-2's utility within forensic practice. This is especially poignant considering the comorbid nature of mental disorder and trauma, and its association with offending as highlighted in Chapter 2's systematic review. Furthermore, in the light of comorbidity and the heterogeneity of MDOs (Blackburn, 2004), the lack of a validity sample for this cohort of individuals proves a shortfall of the TSI-2's application to forensic settings.

Psychometric Properties of the TSI-2

Reliability

The two types of reliability – internal and external – are considered below in relation to the TSI-2.

Internal Reliability:

Internal reliability assesses the consistency of results across items within a test; it refers to evaluating the correlations between the different items of the same test, determining if various items measuring the same general construct yield comparable scores (Field, 2009). Normally, a test is deemed to have an acceptable level of internal consistency with Cronbach's alpha (α) $>.70$ (Kline, 2000).

The TSI-2 manual only provides the data concerning the internal consistencies for the standardisation sample, and not the university, CCV, incarcerated women, or the Gray et al. (2010) samples. For the TSI-2's standardisation sample, all factor scores, clinical scales and subscales, and the two validity scales are internally consistent. The manual reports that the clinical scales and subscales indicate "excellent" internal reliability (Briere, 2011, p.39). This may, however, be overinflating the figures given that for the 24 clinical scales and subscales, Cronbach's alphas range from .76 to .94 as illustrated in Table 4. Of these, five indicate excellent internal consistency (i.e. $\alpha \geq .90$), 16 indicate good internal consistency (i.e. $\alpha \geq .80$ and $\leq .90$), and three are in the acceptable range (i.e. $\alpha \geq .70$ and $\leq .80$); that is, if heeding Kline's (2000) commonly conventional rule.

Table 4
Internal consistencies by TSI-2 scale for the standardisation sample*

Scale	# of items	α
Validity scale		
Response Level (RL)	8	.81
Atypical Response (ATR)	8	.72
Factor		
Self-Disturbance (SELF)	30	.93
Posttraumatic Stress (TRAUMA)	40	.93
Externalisation (EXT)	40	.86
Somatisation (SOMA)	10	.77
Clinical scale/subscale		
Anxious Arousal (AA)	10	.89
Anxiety (AA-A)	5	.83
Hyperarousal (AA-H)	5	.76
Depression (D)	10	.94
Anger (ANG)	10	.92
Intrusive experiences (IE)	10	.91
Defensive avoidance (DA)	10	.91
Dissociation (DIS)	10	.86
Somatic preoccupations (SOM)	10	.84
Pain (SOM-P)	5	.74
General (SOM-G)	5	.76
Sexual Disturbance (SXD)	10	.84
Sexual Concerns (SXD-SC)	5	.80
Dysfunctional Sexual Behaviour (SXD-DSB)	5	.83
Suicidality (SUI)	10	.88
Ideation (SUI-I)	5	.88
Behaviour (SUI-B)	5	.85
Insecure attachment (IA)	10	.91
Relational Avoidance (IA-RA)	5	.88
Rejection Sensitivity (IA-RS)	5	.87
Impaired self-reference (ISR)	10	.88
Reduced Self-Awareness (ISR-RSA)	5	.84
Other-Directedness (ISR-OD)	5	.81
Tension reduction behaviour (TRB)	10	.82

*Adapted from TSI-2 manual (Briere, 2011)

Comparable outcomes regarding internal consistencies were found in a university student sample with alphas from .79 to .93 (Runtz, Godbout, Eadie, & Briere, 2008), and more recent validation research with traumatised psychiatric inpatients in a German-speaking Swiss sample with alphas from .73 to .95 (Krammer et al., 2017).

Although the coefficient alpha is the most commonly used single-administration test score reliability coefficient, it is not the most accurate (Cho, 2016). Researchers are routinely unaware alpha is based on the essentially tau-equivalent measurement model with violation of the assumption of tau-equivalence frequently responsible for underestimating reliability with low alpha values if the assumptions are not met (Graham, 2006). Briere (2011) does not report if the TSI-2 does not violate the assumption of tau-equivalence, hence it can only be assumed that the reported reliability values are accurate.

Moreover, it should be noted that the widely reported conventional cut-off criteria of .70 for Cronbach's alpha is viewed as a methodological 'urban legend' (Lance, Butts, & Michels, 2006). A single reliability standard should be not applied universally. Instead, when espousing a reliability standard there are important contingencies, and the two important issues that define these contingencies are attenuation due to unreliability and the standard error of measurement (Lance et al., 2006).

The generally accepted premise is that the higher the reliability index, the better. However, alpha is affected by dimensionality as it measures the items' homogeneity but, moreover, the homogeneity of what is being assessed. Given that trauma is not a unidimensional construct, the TSI-2's different scales should have some degree of heterogeneity amongst them with the scales more homogeneous than the scale as a whole but with alpha values not too high (i.e. $\geq .90$) as higher values may indicate unnecessary repetition of content across items, suggestive more of redundancy than homogeneity (Streiner, 2003). As five of the TSI-2's clinical scales and two factors have alphas exceeding .90, this needs to be borne in mind.

Cronbach's alpha is furthermore affected by the number of items in the scale with more items associated with higher alpha values irrespective of the homogeneity of items. A high value of alpha (i.e. $>.90$) could also indicate redundancies with many closely related items testing the same concept, suggesting the test's length could be shortened (Tavakol & Dennick, 2011). As shown in Table 4 above, two of the TSI-2's factors have alphas that are $>.90$ (SELF, and TRAUMA) with 30 and 40 items respectively; hence the high alpha values may be attributable to their size.

External Reliability – Test-Retest Reliability:

External reliability refers to the extent to which a measure varies from one use to another with the same subject. The test-retest method assesses consistency of responses gained by administering the same test on two occasions to individuals typically in a small timeframe so the two scores can be correlated to assess the test for stability; the obtained correlation coefficient indicates the measure's reliability.

Improving upon the TSI, Briere (2011) administered the TSI-2 at two different points to a subset of the standardisation sample ($n=31$). Briere (2011, p.40) reports the test-retest coefficients found, and states that all scales except one (Suicidality-Behaviour (SUI-B); $\alpha=.15$) had "excellent" test-retest reliability. The poorer correlation for the SUI-B subscale was attributable to the relatively lower prevalence of suicidal behaviour within the non-clinical sample, resulting in amplifying minor variances (Briere, 2011). It may also be a less consistent construct.

Regarding the coefficients for the factor scores, again, Briere (2011, p.40) describes these as “excellent”. However, upon closer scrutiny, the correlation coefficients for the clinical scales and subscales, barring the SUI-B subscale as highlighted above, ranged from .76 to .94 whilst the factor scores were between .84 and .96, at $p < .01$. This reportage may reflect a general complacency amongst health researchers towards retest reliability values in new instruments especially (Polit, 2014).

Timing between the test and retest is important; too brief a duration could prejudice the results as participants may remember from the first administration. Conversely, too long an interval may bias the results as the sample could change in a critical way. Briere (2011) reports that interval testing times spanned one to 13 days, with the mean interval being just over 5 days. As the correlation coefficient is affected by the time elapsed between the administration of the two tests, the high correlations may possibly be accounted for due to the short time gap as the closer the time, the more similar the factors that contribute to error. Briere (2011) does not rationalise the variation in interval testing times amongst the sample. Although the interval decision should be made with great care, the literature suggests this is seldom the case with the typical interval used in retest studies as ‘intervals of convenience’ (Polit, 2014) as what may be the case with the TSI-2.

Additionally, the relatively brief interim between the TSI-2’s test and retest increases the risk of issues related to memory (with participants remembering their previous responses) and the desire for consistency (as respondents often interpret the retest as an assessment of their ability to be consistent) (Polit, 2014). There is a risk too that answers change at retest, which is unconnected to the stability of test’s items but rather due to the opportunity for rehearsal on the second occasion.

Validity

The TSI-2 manual discusses three types of validity evaluated in the TSI-2: convergent/discriminant validity, factorial validity, and criterion validity. A key stage of a measure's development relates to content and face validity (Connell et al., 2018), hence they too are described.

Face Validity:

Face validity relates to the extent to which a psychometric test seems to subjectively measure the variable it is intended to measure. That is, face validity concerns whether the test's items are sensible, appropriate, and relevant to the persons who use the measure (Connell et al., 2018). It does not have any statistical significance but reflects a common-sense appreciation of the measure. The TSI-2 ostensibly represents acceptable face validity as its items seem germane to trauma exposure and are conveyed with clarity, hence would seem relevant and obvious to test users. If the questions asked lacked specificity, the risk increases that participants do not disclose traumatic experiences, leading to erroneous findings (Read & Fraser, 1998). However, face validity may be compromised with the test participant inadequately able to understand items due to a traumatised mental state, such as acute dissociation, consequently responding wrongly or partially to questions. For that reason, it is important the clinician responds appropriately by suspending testing.

It seems the TSI-2's content is based disproportionately on the judgements of its author and other professionals with restricted input from the core target group it seeks to measure. To improve upon face validity, additional consultation with patients may be beneficial since what may be perceived as a good outcome (i.e. changes and

improvements such as symptom reduction, personal fulfilment, quality of life) by a practitioner or researcher may differ from what is regarded as important to service users (Connell et al., 2018). Service user involvement could improve the tool's quality along with related research.

Furthermore, regarding forensic practice, it may be possible the TSI-2's face validity is moderated when applied to detained persons, especially given the items are based on experiences in the preceding six-months. In which case, some items may seem immaterial given their status as prisoners or secure hospital patients. For example, the test items about sexual activity (e.g. [Item 23] Having sex with someone you hardly knew) would be of prime irrelevance given restricted opportunity, progressively increasing the higher the level of security. In this instance, it may be prudent to consider using the TSI-2-A, a 126-item alternative that does not include sexual symptom items.

Content Validity:

Content validity concerns the extent the test measures all characteristics of the construct. The TSI-2 represents good content validity. Its development originated with the TSI, which was based on existing evidence, clinical experience, as well as consulting with various trauma-specialist clinicians (Briere, 1995). The TSI-2 reportedly was in development for more than five years, revised based on newer research and progress in the trauma field, and responsive to feedback from clinicians and researchers about the TSI (Briere, 2011).

It is important to recognise as research in the trauma arena grows and potentially changes, this may affect the TSI-2's content validity. One such significant and

contemporary advancement relates to complex trauma, and complex PTSD. Complex trauma is a type of trauma, which is recurrent and cumulative, usually occurring over a period of time and in specific relationships and contexts (Courtois, 2004). Victims of exposure to multiple traumas, widespread in clinically complex patients such as forensic populations, may exhibit severer trauma-related symptomatology, necessitating a more specific and tailored assessment approach with the administration of a range of generic and trauma-specific tests relevant to the patient's clinical presentation (Briere & Spinazzola, 2009).

Construct Validity:

Construct validity concerns the degree to which a tests measures what it purports to be measuring. However, as construct validity theory requires a nomological network to validate the constructs (Cronbach & Meehl, 1955), which is rare, the current construct validity approach has retreated to comprising 'interpretation and argument', which is too general, causing validity as a concept to weaken and reducing the credibility of validity claims (Colliver, Conlee, & Verhulst, 2012). TSI-2 users need to be mindful of this when considering its construct validity. Construct validity comprises different subtypes, which are detailed below.

Convergent/Discriminant Validity

Convergent and discriminant validity are interdependent subclasses of construct validity with both required to confirm an instrument's construct validity. Test items should demonstrate a correspondence between similar constructs (convergent validity), and be able to distinguish between unrelated constructs (discriminant validity).

The TSI-2's convergent validity was assessed by investigating the pattern of intercorrelations between the factor, scale, and subscale *T*-scores with the standardisation sample ($N=678$). As convergent validity evaluates if constructs are associated with other theoretically relevant constructs, the finding that all factor, scale, and subscale scores were significantly intercorrelated at $p<.01$ indicates evidence for the tool's convergent validity (Briere, 2011).

As the TSI-2 was created to assess trauma symptoms, the TSI-2's scales were evaluated in terms of their association with trauma exposure (Briere, 2011), as well as their variation across four clinical groups (the CCV sample). Concerning the TSI-2's relationship with trauma exposure in the standardisation sample, barring one subscale, persons with a trauma history endorsed more symptomatology on the TSI-2 factors, scales, and subscales than persons not reporting a minimum of one past traumatic event (Briere, 2011). The SxD-DSB subscale was the only non-discriminatory variable ($r=.03$), with all others significant at $p<.01$ e.g. $r=.26$ (SOMA), $.25$ (AA), and $.25$ (IA). Although these correlations are small to moderate, Briere (2011) concludes they support the TSI-2's construct validity. This should be interpreted cautiously; it may be the correlations' modest magnitudes reflects the complex and multivariate nature of the aetiology of trauma-related outcomes (Briere & Jordan, 2009).

Independent *T*-tests assessed differences in TSI-2 scores between the CCV sample's four groups, and control groups stemming from the standardisation sample, which were matched on age, gender, and race/ethnicity. In sum, the number and degree of statistically significant differences between the combat veterans, victims of sexual abuse and domestic violence, and persons with BPD, and control groups provide good support for the TSI-2's construct validity (Briere, 2011).

Independent *T*-tests were also performed between a demographically matched control sample chosen from the standardisation sample with the incarcerated women sample for comparison purposes ($n=125$ per group). It was found the incarcerated sample had significantly higher means and standard deviations (*SDs*) on the RL and ATR validity scales than the control group. The TRAUMA factor was significantly different vis-à-vis the two groups, predictably as the prisoner sample scored higher on the IE, DA, and DIS scales, and on the AA-H subscale (Briere, 2011). Moreover, the incarcerated women had greater scores than controls on the D and TRB scales, and SXD-SC and SXD-SB subscales. Briere (2011) concludes these results support the TSI-2's construct validity as trauma, abuse, and related sequelae are over-represented in offenders.

It must be recognised this supposition may not be generalisable to male offenders elsewhere in the US or outwith as Briere's small sample was female-only from one Western US penitentiary. Further, Briere (2011) does not account for the non-significant findings discovered for scales and subscales where research suggests offenders are over-represented. These include AA-A, ANG, SUI, IA, and ISR. To illustrate, it is well-documented there is a high prevalence of mental health problems including anxiety, suicide, and past trauma exposure in the prison population (Prisons & Probation Ombudsman, 2016; Singleton, Meltzer, & Gatward, 1998), as evidenced in the systematic review's findings presented in Chapter 2. Likewise, anger (cognitions/behaviours) is a dynamic risk factor and a treatment need prevalent within forensic populations (Novaco, 2011). Insecure attachment and impaired self-reference are correlated with abusive histories as Briere (2011) reflects; this is also substantiated in the evidence base for the offending population where lack of secure attachments disproportionately prevails compared to the general population (Ansbrosio, 2008), and the

impact of enduring stigma *inter alia* cultivates and negatively effects offenders' self-identity (Moore, Stuewig, & Tangney, 2016).

The TSI-2 manual reports the specific correlation coefficients between the initial TSI factors and scales, and their TSI-2 equivalents for the university sample. High correlations were found, indicating good convergent validity, especially for the DA ($r=.98$), IE ($r=.96$), ANG (Anger/Irritability in the TSI) ($r=.94$), and ISR ($r=.98$) scales. Furthermore, new TSI-2 subscales, such as the AA-A and AA-H subscales of the AA scale, correlated well with the TSI's AA scale, both at $r=.81$. Likewise, TSI-2 factors correlated highly with the TSI's; to illustrate, the TSI trauma factor's correlation coefficient with the TSI-2 counterpart (TRAUMA) was .96. Curiously, the TSI's SELF factor was found to correlate more highly with the TSI-2's EXT factor than with the SELF factor ($r=.91$ vs. $r=.80$). Briere (2011) attributes this to changes in the scale contributions to the SELF factor in the TSI and the SELF factor in the TSI-2, the elimination of the TSI's Dysphoria factor, and the introduction of the EXT factor in the TSI-2. The lowest correlations were found for the two validity scales: RL and ATR ($r=.72$ and $r=.76$ respectively), along with the TRB scale ($r=.74$). The manual does not provide explanatory reasons. However, given the value of the validity scales especially, it would be helpful to have some understanding. It is thus apt to contemplate using complementary assessment measures when administering the TSI-2 to determine the credibility of the responses.

Furthermore, the manual reports on two of the new TSI-2 scales, IA and SOM. It was noted the IA's subscales were found to be "mostly correlated" (Briere, 2011, p.43) with their counterparts in a similar construct (i.e. Experiences in Close Relationships-Revised [ECR-R; Fraley, Waller, & Brennan, 2000]), supporting the TSI-2's IA subscales are a valid measure of insecure attachment. The SOM scale was described as "most

correlated" (Briere, 2011, p.43) with the Health Symptom Checklist (HSC; Runtz, 2002), demonstrating the convergent validity of the SOM scale. Unfortunately, no data are supplied.

Grounded on the results of confirmatory factor analysis (CFA) with the standardisation and university samples, the optimal factor solution for the TSI-2 contains four symptom dimensions (factors), including one extra factor, SOMA, which was not included in the original version (Briere, 2011). Godbout et al. (2016) found each factor was a significant predictor of exposure to trauma or some other distressing event, especially posttraumatic stress, providing additional support for the TSI-2's convergent validity.

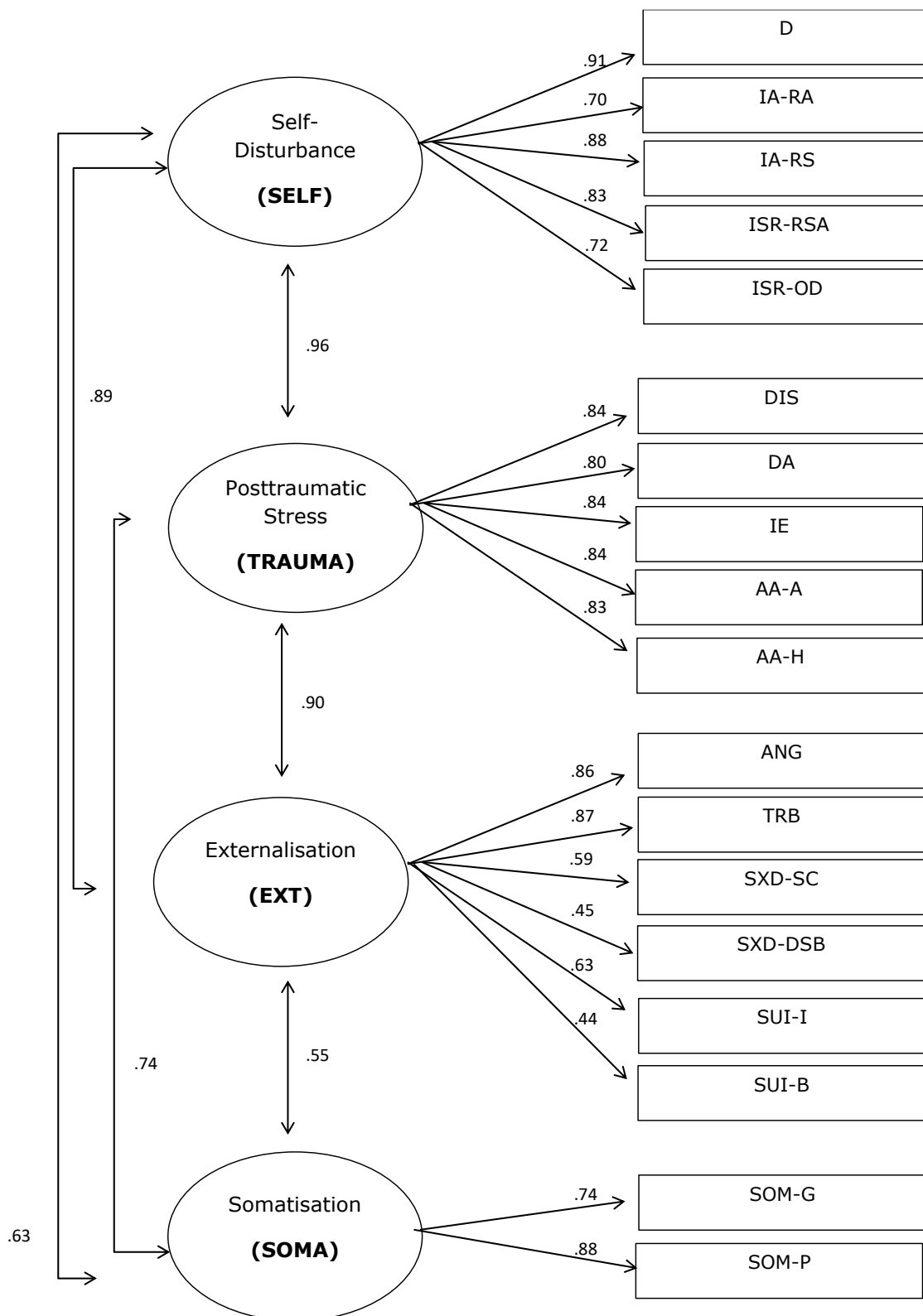
Regarding discriminant validity, Briere (2011) reports the results of the correlational analyses between the TSI-2's posttraumatic stress scales (i.e. AA, AA-A, AA-H, IE, and DA) and the PTSD Checklist-Civilian's (PCL-C; Weathers, Litz, Herman, Huska, Keane, 1991) comparable Reexperiencing, Avoidance, and Hyperarousal scales in the standardisation and university samples. It was found that equivalent scales of the two measures were typically correlated. In the standardisation sample, the TSI-2's IE scale most closely correlated with the PCL-C's Reexperiencing scale ($r=.74$), the DA scale correlated best with the PCL-C's Avoidance scale ($r=.70$), and the AA-H subscale had the highest correlation with the PCL-C's Hyperarousal scale ($r=.75$). These relationships were repeated with the university sample apart from the PCL-C's Avoidance scale was somewhat more correlated with the TSI-2's IE scale ($r=.69$) than the DA scale ($r=.66$). These findings provide support for the TSI-2's discriminant validity concerning measuring posttraumatic stress.

Factorial Validity

Due to its fairly new status, the underlying factor structure of the TSI-2 has not been fully explicated (Godbout et al., 2016). It is noted the TSI-2 manual describes a CFA for the standardisation sample but did not consider the validity of other contending structural models. For example, the TSI manual reports an alternative two-factor model resulting from exploratory factor analyses, and although rejected, was also presented for evaluation in the TSI-2, and was found by Snyder et al. (2009) with a sample of military veterans to be well-fitting with a comparative fit index (CFI) of .89. Further, the TSI's three-factor solution was found to be best-fitting (CFI=.95; Briere, 1995) with similar results found by Snyder et al. (CFI=.95; 2009).

Briere (2011) reports the TSI-2's most parsimonious model indicated by CFA for the standardisation sample was a four-factor one (CFI=.94), and replicated with two other non-clinical samples. Godbout et al.'s (2016) detailed study confirmed the TSI-2's four-factor model was a good fit to the data on all statistical parameters (CFI=.91), which has gained further support (CFI=.95) with European samples (Nilsson, Dahlström, Wadsby, & Bergh-Johannesson, 2018). Figure 4 illustrates the four-factor solution, resulting from factor analysis, which underpins the TSI-2.

Figure 4
Confirmatory factor analysis results for the TSI-2*



* All path coefficients significant at $p < .001$ (Briere, 2011; Godbout et al., 2016)

Figure 4 shows overall the four-factor model provides a good fit to the data, measuring well the postulated factors, and is reflective of trauma theory (Godbout et al., 2016). However, the model seems less reliable regarding the EXT factor score, with relatively lower factor loadings. Scores of .59 and .45 for the SxD-SC and SxD-DSB subscales of the SxD clinical scale, and coefficients of .63 and .44 for the SUI-I and SUI-B subscales of the SUI clinical scale are evident. Additionally, a factor loading of .55 for EXT and SOMA, and a score of .63 for SELF and SOMA is noted. This is neither acknowledged in the manual nor by Godbout et al. (2016), and the data is not supplied. More research is thus indicated to explore further the TSI-2's properties including the examination of other plausible factor solutions (Nilsson et al., 2018).

Criterion Validity

Criterion validity is the degree to which an instrument accurately predicts future outcomes. Validity is typically established by contrasting two instruments' ability to predict a comparable outcome with a specific variable being measured. Concurrent and predictive validity are the two main types of criterion validity. Concurrent validity is used when two instruments measure the same event concurrently whereas predictive validity is applied when the measure is administered, and the findings compared with an outcome after a period of time.

The TSI-2 was administered to the CCV sample along with related measures including the PCL-C, Impact of Event Scale-Revised (IES-R; Weiss & Marmar, 1997), the PAI's Borderline (BOR) scale items, and the MDI (Briere, 2011). As no reference is supplied for the MDI, it is assumed this concerns the Multiscale Dissociation Inventory (Briere, 2002) and not the World Health Organization's Major Depression Inventory, which could potentially be relevant. The results of the correlational analyses between the TSI-2 and

the criterion validity measures demonstrated strong associations; for example, between the TSI-2's IE scale and the IES-R's Intrusion subscale $r=.89$, and with the PCL-C's Reexperiencing scale $r=.89$. The TSI-2's AA-H subscale showed good correlations with the IES-R's and the PCL-C's Hyperarousal scales ($r=.82$), whilst the DA scale was strongly correlated with the Avoidance scales of the IES-R ($r=.80$), and the PCL-C ($r=.81$). Moreover, the PAI's BOR scale showed a significant relationship with the TSI-2's SELF ($r=.71$) and EXT ($r=.79$) factors, and the TRB ($r=.79$) scale. The MDI's total score was particularly correlated with the TSI-2's DIS scale ($r=.83$) and the ISR-RSA subscale ($r=.71$). The RL validity scale was reported as negatively correlated with all other measures.

Though complex PTSD is a controversial diagnosis, included in the ICD-11 but not the DSM-5, it is related to complex trauma and evidence supports its distinct profile and utility (Rosenfield et al., 2018). Regardless, rigorous assessment of complex posttraumatic outcomes informs both diagnosis, and assists with treatment. As the DSM-5 has been revised since the TSI-2's publication to include symptoms of complex trauma, the test's items may not accord with DSM-5 (Briere & Scott, 2015). As with any scale, the TSI-2 needs revision to keep pace with changes in classification of a condition. It may thus be possible the TSI-2 is limited with its applicability as a standalone measure for assessing psychological outcomes of complex trauma or complex PTSD. Accordingly, it may be judicious to supplement the TSI-2 with a clinical interview when assessing complex trauma/PTSD.

Research has found a linear relationship between the amount of trauma experienced and symptom complexity, even when controlling for specific traumatic events, which suggests a generalised effect of cumulative trauma (Briere, Kaltman, & Green, 2008; Briere & Spinazzola, 2009). The implication is that symptom complexity is associated

with greater trauma. This would be an indicator of criterion validity but has not been examined. It is important the individual's full trauma history is considered; therefore, a comprehensive, multi-assessment approach when evaluating trauma symptomatology including empirically validated assessment measures and structured diagnostic interviews involving generic tests, complemented by clinical assessment interviews instead of sole reliance on the TSI-2, is advisable to ensure best practice.

To measure the TSI-2's posttraumatic stress scales' ability to predict actual PTSD status, discriminate functional analysis was carried out utilising the AA-H, IE, and DA scales' *T* scores to predict PTSD established by the PCL-C. Results indicated an optimally weighted combination of the TSI-2 scales significantly predicted PTSD ($\chi^2[3]=187.97, p<.01$) with a sensitivity of 1.00 and specificity of .88 (Briere, 2011). To further test the predictive ability of relevant TSI-2 scales for PTSD, the TRAUMA factor's correlation to PTSD status was measured using the Receiver-Operator Curve (ROC) Area Under the Curve (AUC) coefficient, which is the preferred measure of predictive or diagnostic accuracy in forensic psychology (Rice & Harris, 2005). The TRAUMA factor had excellent predictive validity (.98) of PCL-identified PTSD (Briere, 2011).

The predictive validity of the ATR's scale to distinguish genuine from simulated PTSD symptoms was evaluated by Gray et al. (2010) with a sample of university students ($N=124$). Seventy-five participants feigned PTSD and their ATR scores were compared to responses of 49 students with genuine PTSD symptoms. Discriminant functional analysis indicated the ATR scale had good predictive validity for malingered PTSD with sensitivity of .75, and specificity of .74. Although due caution should be exercised around the generalisation of university students' simulation abilities vis-à-vis community or forensic samples, it is possible using university students affords a more

conservative test of malingering detection (Gray et al., 2010). Further, as noted earlier, these results marked an improvement in the TSI's ATR scale (Briere, 2011).

A different aspect of the predictive validity of the ATR's scale (over-reporting of trauma outcomes in general) was tested in the standardisation sample with a series of ANOVAs with the four factors. With a highly elevated factor score defined as a percentile ≥ 90 , the results indicated that ATR scores were correlated with high factor scores for each factor (SELF=.42, TRAUMA=.48, EXT=.38, SOMA=.38; $p < .01$). Additionally, one-way ANOVAs revealed a strong relationship between the number of percentile elevations ≥ 90 and the ATR score ($F[4,673]_{\text{linear term}} = 76.84$, $p < .001$, $\eta^2 = .32$). Collectively, these results suggest the ATR scale evaluates over-reported posttraumatic stress/PTSD symptoms but also unusually high (and rare) reporting of symptoms in the other areas tapped by the TSI-2; particularly SELF, EXT, and SOMA (Briere, 2011).

The evidence confirming the TSI-2's ability to predict trauma-related outcomes has important implications for both clinical and research purposes. Concerning quantitative research, good criterion validity indicates the TSI-2 will yield reliable data for further quantitative analysis (e.g. assessing trauma therapy outcomes), which provides robust evidence for reaching dependable conclusions. It is also helpful when other measures are used for comparison purposes, and direct to the strongest link for a particular variable. Moreover, with qualitative research, wherein data is more subjective, criterion validity is even more important to lessen researcher bias, leading to more robust conclusions.

Conclusion

The aforementioned critique of the TSI-2 has presented its strengths and needs, including its application in forensic settings, as an assessment measure of trauma-

related symptoms and behaviours. Contrasted with other trauma-specific tests, the TSI-2 not only measures core symptomatology of PTSD specifically, but more general trauma-related sequelae, maximising its utility. The TSI-2 is thoroughly grounded on relevant theory and practice, and its items are pertinent to the construct under assessment. Since the TSI-2 is a relatively new measure, its psychometric properties are less established than the original TSI (Godbout et al., 2016). The available evidence suggests the TSI-2 is a sound assessment tool with good psychometric properties, and can be recommended for clinical and research purposes (Nilsson et al., 2018).

The TSI-2 demonstrates good reliability and validity in general. As the TSI-2 was normed on primarily Caucasian, American, and relatively educated individuals, this limits its generalisability to persons differing demographically for whom the test is intended. This highlights a particular shortfall of the TSI-2's relevance within forensic settings. It is essential this is borne in mind when using the test in forensic practice, and assessment is complemented with other measures to mitigate biases.

The TSI-2, as documented hitherto, is a relatively novel instrument, necessitating more research. With regards to forensic practice, it would be beneficial for studies to explore the TSI-2 in relation to offenders and MDOs. It would seem most trauma-related research focusses on victims of trauma. Given that initiators of a traumatic event (i.e. persons responsible for committing trauma) can develop trauma symptomatology/PTSD themselves, which can be delayed as evidenced in the offender population, further research needs to include the psychological effects that committing violent acts can have on the perpetrator, and when, or if treatment is indicated (Gray et al., 2000; Rogers, Gray, Williams, & Kitchiner, 2000). Furthermore, trauma incidence rates for MDOs are high, possibly due to the confluence of their victim status and the

commission of a serious violent offence, which can trigger PTSD-related symptoms (Gray et al., 2003). This has important treatment and risk management implications for forensic psychology practice. As trauma in MDOs can be a chronic stressor and relapse indicator, preventing treatment gains or leading to relapses, this could increase the ability to effectively treat offenders with comorbid trauma and mental disorder; this is explored in detail in Chapter 4.

CHAPTER 4

QUANTITATIVE INVESTIGATION EXPLORING THE RELATIONSHIP BETWEEN PAST TRAUMA AND SUBSTANCE MISUSE IN MDOs AND IF GENDER DIFFERENCES EXIST

Introduction

The findings from Chapter 1's literature review indicate high concordance rates between past trauma and problematic substance misuse, with higher levels of past trauma in persons with co-occurring mental disorder and substance misuse (Aakre et al., 2014; Stewart et al., 1998; Wiechelt et al., 2011). Furthermore, the literature review confirmed there was insufficient evidence to include gender-specific predictions about the relationships between trauma, substance misuse, and trauma-related distress, especially given the paucity of studies for MDOs. Chapter 2's systematic review's conclusions showed women seem to have different vulnerability factors vis-à-vis men; it was discovered there were socioeconomic and mental health-related differences between male and female substance-using convicted offenders (e.g. Langan & Pelissier, 2001; Messina et al., 2003; Zlotnick et al., 2008a). These findings suggest that research comparing relationships between trauma, substance misuse, and trauma-related distress between genders should control for these variables as potential confounds. Recruiting a homogeneous sample of men and women from a high secure hospital for MDOs limited variability, hence reducing possible confounders such as mental health problems.

The current study aims to explore the relationship between past substance use and current trauma-related distress in a representative sample of high-risk MDOs with high rates of trauma and substance use. In order to understand the specific relationships between trauma and substance use in women, it is important to establish the

relationship in the whole population, and explore the impact of moderating factors such as age.

A shared finding from Chapters 1 and 2 is that women generally are under-investigated, and this is especially pertinent for female MDOs. Langan and Pelissier's 2001 study, as reported in Chapter 2, found one of the strongest independent gender differences in prison-based substance users was that women had higher rates of childhood physical or sexual abuse than men. It was important to determine if this finding held with a standardised high-risk MDO sample. A second aim of the study therefore is to determine what characteristics are distinct for women regarding the relationship between trauma and substance misuse firstly by contrasting relationships in male and female high-risk MDOs, and secondly by using a mixed methods approach to explore the question (the relationship between past trauma and past substance use in female MDOs) using both quantitative and qualitative methods. The study's sample permitted the examination of the specific gender-related needs of women, which is especially valuable given that interventions are usually based on research with men. Moreover, the mixed methods approach, which investigates women separately and in-depth, fully explores the relationships between trauma and past substance use in high-risk female MDOs, endeavouring to really understand their experience.

Research Question and Hypotheses

The main research question for the quantitative study is:

What is the relationship between past substance misuse, past trauma, and current trauma-related anxiety and depression in MDOs detained in conditions of high security?

The research question leads to the following hypotheses:

Hypothesis 1: In MDOs, higher levels of past trauma exposure as measured by the Life Events Checklist for DSM-5 (LEC-5; Weathers et al., 2013) will be associated with greater severity of past problematic substance use. Severity of substance misuse will be determined by combining ratings from the Drug Abuse Screening Test (DAST-20; Skinner, 1982) and the Alcohol Use Disorder Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993) into a composite score reflecting overall level of harmful substance use.

Hypothesis 2: In MDOs, higher levels of past substance use severity will be associated with higher levels of current trauma-related anxiety and depression as gauged by the Trauma Symptom Inventory-2 (TSI-2; Briere, 2011), once previous trauma (LEC-5) scores have been controlled for.

Design

The research was a mixed methods design (Creswell, 2014), employing both quantitative and qualitative methodology to explore the relationship between trauma-exposure and substance use in MDOs. The study comprised two constituents: (1) a cross-sectional, self-report survey of previous substance use utilising the DAST-20 and AUDIT, and past trauma exposure via the LEC-5, followed by the administration of the TSI-2 to gauge current trauma-related psychological stress for those who had experienced past trauma exposure and a bespoke questionnaire designed to determine specific drugs used in the past, and (2) a qualitative study involving face-to-face semi-structured interviews with a subset of female MDOs (target $n=20$).

Although it is not possible to eliminate the risk of confounding variables without an experimental design, mixed methods research is increasingly being used by health

researchers especially as the value of qualitative approaches has gained improved recognition worldwide (Creswell & Plano Clark, 2011; O’Cathain, Murphy, & Nicholl, 2010; Tariq & Woodman, 2013); its social constructivist approach recognises the importance of context, and that it is not possible to measure all influencing variables. Combining qualitative data collection, which allows a non-evasive and ethical way of exploring the issues, with quantitative data collection, can avoid pre-judgements by explaining why a specific answer was given. Furthermore, given the time and cost restraints involved, this design made the process more effective and less resource intensive, which had important implications for the feasibility and tractability of the study. Consequently, employing mixed methods research has the potential to harness the strengths and offset the weaknesses of both approaches; moreover, it can be an effective method when addressing complex, multi-faceted issues (Creswell, 2014; Tariq & Woodman, 2013).

Ethics

As the study involved National Health Service (NHS) patients, the research proposal was submitted to and approved by the National Research Ethics Service (NRES), which is part of the Health Research Authority (HRA) (refer to Appendix 3). Subsequent to this, local authorisation was requested and received from the Research and Development Department of Nottinghamshire Healthcare NHS Foundation Trust. The BPS’ (British Psychological Society’s) Code of Ethics and Conduct was adhered to throughout, along with the HCPC’s (Health and Care Professions Council’s) Standards of Conduct, Performance and Ethics given the researcher is a HCPC-registered professional.

It is acknowledged that ethical consent included approval to collect further data concerning an additional research aim for the qualitative study regarding seeking the views of female MDOs pertaining to their substance misuse treatment needs, including the strengths and weaknesses of interventions experienced. Although this data was collected, its analysis and reporting is beyond the scope of the thesis; hence the data related to this additional aim will be subject to analysis and appropriate dissemination in the future.

All participants were carefully briefed. They were apprised about the purpose of the research, the procedure, and that participation was voluntary and withdrawal at any point without reason was permissible and would not affect their medical care or legal rights. It was recognised the researcher-participant relationship is one of imbalanced power, which may be more acute in a forensic mental health environment when the treatment provider is requesting participation; hence, due sensitivity was applied to circumvent unwarranted solicitation (Draucker, 1999).

Informed consent was obtained from each participant (refer to Appendix 4); as patients are deemed vulnerable adults under the Mental Capacity Act (2005), each patient was also screened to assure they had capacity to provide informed consent. Given that capacity can fluctuate, this was an ongoing process.

Assurance was specified that data collected would be kept confidential on an NHS encrypted computer for analysis, anonymity respected and if they withdrew from the study, their data would be destroyed. Storing and retaining the data for future use is commensurate with the Data Protection Act (1998), and latterly, the General Data Protection Regulations (2016).

Following the interviews, the nurse-in-charge was provided a verbal handover to confirm if there were any patient risk-related issues, which was recorded on the Hospital's electronic clinical records system. If a confidential security risk-related disclosure was made, an SIR (Security Information Report) was completed as per Hospital policy, although this transpired to be unnecessary.

Trauma-related research has, justifiably, raised ethical concerns regarding the impact on participants from unleashing painful emotions and memories in recalling historical trauma and stressful life events – the Pandora's box phenomena (Draucker, 1999). Therefore, it was recognised that reflecting on trauma and substance use, along with the associated contexts, would likely resurrect sensitive and upsetting memories. During the interview, the questions may have generated emotional responses, which were acknowledged by the researcher. The degree of emotional response varied with participants, and so was assessed on an individual basis with regards to the boundaries of confidentiality. The researcher responded to issues as they arose, in a responsive and appropriate manner. The course of action was clearly documented as part of the research process. Following the interview, if a participant presented as affected, this was highlighted to the nurse-in-charge during the handover by the researcher at the conclusion of each interview; the nurse-in-charge provided intervention as appropriate. The participant's named nurse and Responsible Clinician (RC) were subsequently apprised. All actions were recorded.

Each participant was debriefed at the conclusion of the interview. However, if a more detailed debrief was subsequently required, participants were invited to contact the researcher, and their named nurse or RC. Contact details of the researcher and supervisor were thus provided.

The two studies are presented separately but as they together form a mixed methods study, they have shared a common introduction in this chapter, and the qualitative study's discussion (Chapter 5) will integrate the findings from both studies.

Aims

The main aim of the quantitative part of the study was to determine the prevalence of past trauma exposure, and the extent of past substance use, in high-risk MDOs, and then to investigate the differences between male and female participants with regards to current trauma-related psychological sequelae, and its relationship to substance use.

Method

Participants

Patients detained under the MHA (1983/2007) in one high secure hospital were recruited to the study. The maximum number of participants in the study eligible for recruitment was 78 ($n=44$ for the Men's PD Service, $n=34$ for the Women's Service).

Inclusion criteria for the study comprised the following:

1. Between the ages of 18- and 65-years-old.
2. Detained under the MHA (1983/2007) in the Men's PD Service or the National Women's Directorate within the study period.

Exclusion criteria for the study included:

1. Inability to give informed consent.
2. Intellectual disability hence with an $IQ \leq 70$.
3. Any clinical or other issue that precluded the individual from full engagement in the research such as acute mental health problems or cognitive impairment, as identified by the clinical team.

All women who met eligibility criteria were sampled, whilst for men, each one eligible from the PD Service was selected. Although men were sampled from the PD Service for pragmatic reasons, the whole sample was similar with comparable rates of PD, past trauma, and current trauma-related distress.

Materials

Patient Information:

Data relating to patients' demographics including gender, age, length of admission, marital status, religion, ethnicity, education, MHA (1983/2007) status, along with psychiatric diagnoses, and index offence(s) were gleaned from the electronic records.

Trauma Screening:

The LEC-5 (Weathers et al., 2013) was administered to screen for the presence of trauma exposure (see Appendix 5). The LEC-5 is a 17-item self-report DSM-validated measure to screen for potentially traumatic events in a person's lifetime; it measures exposure to 16 events known to possibly result in trauma including an extra item

assessing any other extremely stressful event not described in the 16 items. Initially developed alongside the Clinician-Administered PTSD Scale (CAPS) to be completed in advance of the CAPS, the LEC-5 has been validated as a standalone assessment of trauma-exposure, especially regarding reliability of respondents' experiences (Gray, Litz, Hsu, & Lombardo, 2004).

Participants were asked if they experienced direct (i.e. the event personally happened to them) or indirect (i.e. they witnessed or learned of the event) potentially traumatic experiences (Weiss, Tull, Lavender, & Gratz, 2013); to calculate the total amount of trauma exposure and consistent with past research (e.g. Kantor, Knefel, & Lueger-Schuster, 2017), items endorsed as having been experienced or witnessed by the respondent obtained a score of 1 and were tallied, with 17 the maximum score.

Trauma-Related Symptomatology:

In order to measure the psychological outcomes of past trauma exposure, the TSI-2 (Briere, 2011) was utilised. As detailed in Chapter 3, the TSI-2 is a 136-item inventory that measures posttraumatic symptomatology and other psychological sequelae of traumatic events. Although the critique identified the TSI-2-A may have advantages with a detained forensic population as it does not include any sexual symptom items, licensing permissions at the study site were only in place for the TSI-2; hence the TSI-2-A was not accessible.

The TSI-2 comprises four factors – Self-Disturbance, Posttraumatic Stress, Externalisation, and Somatisation, which allow consideration of broader symptom domains, and serve as summary measures of complex posttraumatic disturbance (Briere, 2011). The clinical scale and subscale structure of the four factor scores is presented in Table 5.

Table 5
TSI-2 factor, scale, and subscale organisation (adapted from Briere, 2011)

Factors	Scales	Subscales
Self-Disturbance	Depression Insecure Attachment Impaired Self-Reference	Relational Avoidance Rejection Sensitivity Reduced Self-Awareness Other-Directedness
Posttraumatic Stress	Anxious Arousal Intrusive Experiences Defensive Avoidance Dissociation	Anxiety Hyperarousal
Externalisation	Anger Sexual Disturbance Suicidality Tension Reduction Behaviour	Sexual Concerns Dysfunctional Sexual Behaviour Ideation Behaviour
Somatisation	Somatic Preoccupations	Pain General

As shown in Table 5, of particular relevance to the study are the Self-Disturbance and Posttraumatic Stress factors, which link to depression and anxiety.

Participants were asked to rate the frequency of each symptom on a four-point Likert scale from 'never' to 'often' (i.e. from 0 to 3). The TSI-2 evaluates the relative level of different forms of posttraumatic stress distress experienced in the last six-months via the 12 clinical scales catalogued above, encompassing 12 subscales, producing an overall trauma symptom profile. For each TSI-2 scale/subscale, *T*-scores less than 60 are deemed 'not clinically significant', between 60 and 64 are judged as 'problematic', whilst greater than 65 are considered 'clinically elevated'. As the TSI-2 does not generate a global trauma score, the data regarding the frequency of these three categories occurring are reported.

As elucidated in Chapter 3, the TSI-2's psychometric properties are less established than the original TSI (Godbout et al., 2016). However, research to date has demonstrated the TSI-2 as a reliable measure with Cronbach's alphas between .72 to .94 in clinical samples (Briere, 2011), and alphas ranging from .79 to .93 in a study with university students (Runtz et al., 2008). Validity has been established with TSI-2 subscale scores with university students (Briere, 2011), and with a sample drawn from the general population (Godbout et al., 2016). This is discussed in detail in the psychometric test critique provided in Chapter 3.

Substance Use:

In order to measure past substance use, four measures were utilised. These included two pre-existing psychometric tests along with two bespoke measures.

The first measure was the DAST-20 (Skinner, 1982). The DAST-20 is a 20-item self-report measure designed to determine if the respondent has ever used drugs and, if so, the different consequences of their drug use (see Appendix 6). 'Drug abuse' means the use of prescribed or over-the-counter drugs in excess of the directions, and any non-medical use (Skinner, 1982). A quantitative index of problems associated with drug use is generated through summing all items endorsed in the direction of increased problematic use, extending from 0 to 20, categorising the participant along a continuum regarding the degree of problems/consequences concerning drugs. Cut-off scores from 6 to 11 are regarded as optimum for screening for substance use disorders, meeting DSM-5 criteria. The DAST-20 has shown good reliability and validity within different settings with various populations including prisoners, and psychiatric patients (Maisto, Carey, Carey, Gordon, & Gleason, 2000; Peters et al., 2000; Yudko, Lozhkina, & Fouts, 2007).

The second measure was the AUDIT (Saunders et al., 1993), which was administered to gauge past alcohol consumption, drinking behaviour, and alcohol-related problems (refer to Appendix 7). It is a 10-item questionnaire that scores each item on a four-point Likert scale from 0 to 4, yielding a maximum possible score of 40. Higher scores denote increasing problematic use. Scores from 8 to 15 are considered risky or hazardous drinking levels, 16 to 19 indicate high-risk or harmful levels, whilst a score of 20 or more suggests high-risk and dependency. Research has demonstrated the AUDIT to be a reliable and valid measure in various settings with diverse populations including offenders and persons with mental disorder (Dawe, Seinen, & Kavanagh, 2000; de Meneses-Gaya, Zuardi, Loureiro, & Crippa, 2009; Reinert & Allen, 2007; Thomas, Degenhardt, Alati, & Kinner, 2014).

The third measure was a bespoke 'Substance Use Severity Scale', which was tailored from combining the DAST-20 and AUDIT scores to form a comparison parameter to show the relative rank of the overall severity of substance use. This is detailed in Table 6.

Table 6
Groupings for Substance Use Severity Scale

	Score	Severity	Designation
DAST-20	<6	Low	0
	6-11	Intermediate	1
	≥12	Substantial/severe	2
AUDIT	0-7	Low risk	0
	8-19	Hazardous/harmful	1
	20-40	Almost certainly dependent	2

As presented in Table 6, participants' DAST-20 results were grouped into one of three categories contingent on severity of use, with scores less than 6 assigned a '0', from 6 to 11 given a '1', and scores greater than or equal to 12 categorised as '2'. Similarly, AUDIT results were sorted based on severity with scores from 0 to 7 assigned a '0', 8 to 19 ascribed a '1', and from 20 to 40 inclusive a '2'.

By amalgamating the re-coded DAST-20 and AUDIT scores, a five-point ordinal scale with values ranging from 0 to 4 was created to provide information representative of the relative gross severity of past substance use. This is charted in Table 7.

Table 7
Configurations for calculating Substance Use Severity Scale scores

	Scale value	0 Non-problematic	1 Mild	2 Moderate	3 Serious	4 Severely problematic
Amalgamated scores		DAST-20=0 and AUDIT=0	DAST-20=1 or AUDIT=1	DAST-20=1 and AUDIT=1	DAST-20=2 or AUDIT=2	DAST-20=2 and AUDIT=2

As shown in Table 7, scale values between 0 and 4 were assigned to participants by combining their DAST-20 and AUDIT scores to deduce their overall degree of past substance use severity relative to others.

The fourth measurement tool, a bespoke questionnaire, was formulated to determine the specific types of drugs used. Respondents were asked to indicate from a set list which CNS psychoactive drugs they used prior to detention (refer to Appendix 8). This included both licit (i.e. alcohol and nicotine) and illicit depressants, stimulants, and hallucinogens.

Recognition of the detained status of participants in a high security environment, where alcohol and illicit substances are prohibited, necessitated adapting the timeframe for substance use to the period preceding the commission of the index offence and/or prior to detention, hence when last at liberty in the community vis-à-vis any current use.

Procedure

A recruitment poster was displayed on the wards. The researcher met with the RCs within the Men's PD and the National Women's Directorate to discuss the study. The RCs were furnished with a copy of the inclusion and exclusion criteria, and requested to screen and propose suitable patients under their care. Additionally, potential participants were canvassed to partake in the research by the ward manager at the respective ward's community meetings where the Participant Information Sheet (refer to Appendix 9) was provided.

The male PD Service comprises three wards with patients with a primary PD diagnosis whereas the Women's Service includes four wards: two for patients with a primary diagnosis of PD, one for patients with a primary mental illness diagnosis, and one ward for 'high dependency' patients including those with intellectual disabilities.

In meeting with the researcher, patients were informed of the study's purpose both verbally and in writing via reviewing the Participant Information Sheet, and were assured of their confidentiality and right to withdraw from the study at any time. Written consent was taken. As noted earlier, monitoring patients' capacity to consent was a continuous practice from the informed consent stage through to the completion of data collection. Information was, in addition, provided to multi-disciplinary staff in order to support the research and patients' participation.

Participants' inclusion criteria were confirmed via the clinical records system and via consultation with the patients' RCs. Past substance use and trauma were furthermore detected with the DAST-20 and AUDIT, and the LEC-5 respectively when consenting patients were interviewed. To maximise confidentiality, interviews were undertaken on an individual basis unless individual risk assessments stipulated otherwise. In the case

of interviews that required escorting staff due to risk issues, a briefing was provided to these persons in advance of the interview regarding study aims, confidentiality, and their role as a non-participant observer.

The interviews were held on the respective patients' wards in the designated interview room. Eligible and consenting participants completed the measures described in the preceding materials section at interview. The same instructions were given to all participants before they were administered. Patients were offered the choice of self-administering the questionnaires in the presence of the researcher, or, in recognition of the need to address responsivity issues and variation in literacy for some participants, questions could also be read aloud and recorded by the researcher. Participants were encouraged to answer as honestly as possible, based on their experience. Those not involved with the qualitative study (Chapter 5) were thanked for their contribution, and advised feedback about the study's findings would be offered in due course.

Analysis

An *a priori* power analysis was performed to determine the number of participants required to achieve sufficient statistical power. Using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) for linear multiple regression (random model) with four independent variables with the generally recommended power level of .80 (Tabachnick & Fidell, 2007) and alpha .05, the minimum target sample size was 42 participants.

Data analyses were performed using SPSS Version 19 (IBM, 2010). Descriptive statistics of the demographics were analysed, and are reported with regard to the total number of participants and percentages of the sample concerning gender and a particular characteristic.

The demographic data generated categorical measures whilst the trauma assessments provided continuous measures. The questions for substance use yielded categorical and ordinal measures.

The variables' distributions were checked for normality via visual inspection of standard deviations (*SDs*) and histograms, and the Shapiro-Wilk test, which provides better power comparative to the Kolmogorov-Smirnov (Ghasemi & Zahediasl, 2012). The data for the LEC-5, TSI-2, and the Substance Use Severity Scale were found to be normally distributed, hence parametric whilst the AUDIT's and DAST-20's data followed non-normal distributions and so were non-parametric. Gender differences for demographic variables and psychometric test results were calculated using *T*-tests, Mann-Whitney *U* tests, and Chi-squared analyses where appropriate.

To determine the association between severity of trauma exposure as measured by the LEC-5, and past substance use severity as gauged with the DAST-20 and AUDIT in the total sample (Hypothesis 1), Pearson product-moment correlation coefficient was used. To test Hypothesis 2, regarding past substance use severity (the independent variable) determined by the DAST-20 and AUDIT, and severity of current trauma-related anxiety and depression (the dependent variable) utilising the TSI-2, multiple regressions were conducted.

Results

Sample

Of the 78 potential participants ($n=44$ for Men's PD, and $n=34$ for Women's), 58 (74.36%) met the criteria and agreed to take part; all were recruited through ward community meetings. As G*Power had calculated 42 participants as the minimum target, the number of recruited participants maximised statistical power. The response rate was moderately similar for male ($n=31$; 70.45%) and female ($n=27$; 79.41%) participants.

The results of the quantitative study are presented below. There were no missing data. However, for calculations involving the TSI-2, one male participant was excluded from the analyses due to an invalidated protocol as the cut-off for one of the validity scales was exceeded.

Descriptive Statistics

Demographic Data:

The age of the sample ranged from 20- to 64-years-old ($M=37.90$) with slightly more male ($n=31$; 53.45%) than female ($n=27$; 46.55%) participants. Length of admission varied from 6-months to 23.66-years with a mean of 6.16-years. Regarding gender differences, male participants were older than their female counterparts ($T[52.32]=2.76$, $p=.008$, two-tailed)(equal variances not assumed), and had a significantly longer length of admission compared to women ($U=280$, $z=-2.16$, $p=.03$, $r=-.28$) (Table 8a).

Table 8a
Demographic variables by gender and for total group

	Male PD Service (<i>n</i> =31)	Women's Service (<i>n</i> =27)	Whole Sample (<i>N</i> =58)
Age			
Mean (<i>SD</i>)	41.42 (12.49)	33.85 (8.22)**	37.90 (11.29)
Median (Range)	45.00 (23-64)	33.00 (20-51)	36 (20-64)
Length of admission in months			
Mean (<i>SD</i>)	87.42 (60.57)	58.33 (60.43)*	73.88 (61.73)
Median (Range)	85.00 (7-218)	39.00 (6-284)	45 (6-284)
Marital status (%)			
Single	25 (80.60)	22 (81.50)	47 (81.03)
Married	0 (0.00)	1 (3.70)	1 (1.72)
Divorced/separated/widowed	5 (16.13)	4 (14.81)	9 (15.52)
Not stated	1 (3.20)	0 (0.00)	1 (1.72)
Religion (%)			
Any Christian	20 (64.52)	12 (44.44)	32 (55.17)
Other	7 (22.58)	6 (22.22)	13 (22.41)
Not known	4 (12.90)	9 (33.33)	13 (22.41)
Ethnicity (%)			
White British	31 (100.00)	25 (92.60)	56 (96.55)
Dual Heritage (White and Black Caribbean)	0 (0.00)	2 (7.40)	2 (3.45)
Education qualifications (%)			
None	22 (70.97)	20 (74.07)	42 (72.41)
GCSEs/O levels	8 (25.81)	5 (18.52)	13 (22.41)
Further education	1 (3.23)	2 (7.41)	3 (5.17)
MHA Section (%)			
3	1 (3.20)	5 (18.50)	6 (10.34)
37	0 (0.00)	3 (11.10)	3 (5.17)
37/41	9 (29.00)	8 (29.60)	17 (29.31)
37/41 (DVCVA)	0 (0.00)	1 (3.70)	1 (1.72)
41(5)	2 (6.50)	3 (11.10)	5 (8.62)
45(a)	0 (0.00)	1 (3.70)	1 (1.72)
47/49	19 (61.29)	6 (22.20)	25 (43.10)
MHA Section (%) (collapsed)			
Hospital orders	12 (38.71)	21 (77.78)**	33 (56.90)
Prison transfers	19 (61.29)	6 (22.22)	25 (43.10)

**p*<.05 (two-tailed)

***p*<.01 (two-tailed)

The majority of participants had no formal educational qualifications (*N*=42; 72.41%), with a single marital status (*N*=47; 81.03%), and were of White British ethnicity (*N*=56; 96.55%). Regarding religion, more than half of the sample indicated they were Christian (*N*=32; 55.17%). There were no significant gender differences in relation to education, marital status, ethnicity, and religion.

Over two-thirds ($N=42$; 72.41%) of participants were detained under either Section 37/41 ($N=17$; 29.31%) or Section 47/49 ($N=25$; 43.10%) of the MHA (1983/2007). Chi-squared test for independence (with Yates Continuity Correction) indicated men were significantly more likely to be sentenced prisoners transferred under the MHA (1983/2007) whilst women were more likely to have hospital orders, $\chi^2(7.46, N=58)$, $p=.0063$ (two-tailed).

Most of the sample had an index offence comprising a violent offence against the person ($N=52$; 89.67%) (Table 8b).

Table 8b
Demographic variables by gender and for total group continued

	Male PD Service ($n=31$)	Women's Service ($n=27$)	Whole Sample ($N=58$)
Diagnosis (%)			
Personality disorder			
Any personality disorder	30 (96.77)	25 (92.59)	55 (94.83)
<u>Cluster A</u>			
Any	14 (45.16)	2 (7.41)**	16 (27.59)
Paranoid	11 (35.48)	2 (7.41)	13 (22.41)
Schizoid	4 (12.90)	1 (3.70)	5 (8.62)
Schizotypal	2 (6.45)	0 (0.00)	2 (3.45)
<u>Cluster B</u>			
Any	29 (93.55)	25 (92.59)	54 (93.10)
Antisocial	26 (83.87)	17 (62.96)	43 (74.14)
Borderline	23 (74.19)	25 (92.59)	48 (82.76)
Histrionic	1 (3.23)	1 (3.70)	2 (3.45)
Narcissistic	1 (3.23)	1 (3.70)	2 (3.45)
<u>Cluster C</u>			
Any	17 (54.84)	1 (3.70)***	18 (31.03)
Avoidant	16 (51.61)	1 (3.70)	17 (29.31)
Dependent	3 (9.68)	0 (0.00)	3 (5.17)
Obsessive-compulsive	1 (3.23)	0 (0.00)	1 (1.72)
Mental illness			
<u>Anxiety disorders</u>	4 (12.90)	8 (29.63)	12 (20.69)
<u>Mood disorders</u>	6 (19.35)	3 (11.11)	9 (15.52)
<u>Psychosis</u>	7 (22.58)	7 (25.93)	14 (24.14)
Other mental disorder (non-sexual)	1 (3.23)	2 (7.41)	3 (5.17)
Other mental disorder (sexual)	2 (6.45)	0 (0.00)	2 (3.45)
Learning and developmental disorder	3 (11.11)	0 (0.00)	3 (5.17)

Index offence (%)			
Offence against the person – violent	26 (83.87)	26 (96.31)	52 (89.67)
Offence against the person – sexual	13 (41.94)	0 (0.00)	13 (22.41)
Offence against property	13 (41.94)	8 (29.63)	21 (36.21)
Other	3 (9.68)	6 (22.22)	9 (15.52)

** $p < .01$ (two-tailed)

*** $p < .001$ (two-tailed)

Although nearly all participants had a diagnosis of any PD ($N=55$; 94.83%), gender differences were found with regards to type of PD. Chi-squared tests for independence (with Yates Continuity Correction) revealed that males had a significantly greater likelihood of having a Cluster A PD [$\chi^2(1, N=58)=8.49, p=.0013$ (two-tailed)]; men were more likely to have at least one Cluster A diagnosis (45.16%) compared to women (7.41%). Male participants also had an increased probability of having a Cluster C PD [$\chi^2(1, N=58)=15.32, p<.00001$ (two-tailed)], with 54.84% diagnosed with a minimum of one Cluster C versus 3.70% of females. Rates for Cluster B were found to be similar for the genders.

Trauma Prevalence:

All 58 participants endorsed experiencing a past traumatic life event without exception. Table 9 presents the outcomes for level of past trauma exposure. The sample had experienced a mean of 7 traumatic events (range 2 to 14).

Table 9**Outcome variables by gender and for total group for trauma exposure (LEC-5)**

	Male PD Service (<i>n</i> =31)	Women's Service (<i>n</i> =27)	Whole Sample (<i>N</i> =58)
LEC-5			
Mean (<i>SD</i>)	6.84 (2.30)	7.56 (2.49)	7.17 (2.39)
Median (Range)	7.00 (3-13)	7.00 (2-14)	7.00 (2-14)

The current study found no significant differences between male participants and female participants ($T[56]=-1.14$, $p=.26$, two-tailed)(equal variances assumed) regarding average number of lifetime trauma events experienced.

Substance Use:

The present study's results indicate that the majority of participants ($N=50$; 86.21%) have misused substances historically. As per Table 10, concerning drug use, DAST-20 results showed that two-thirds of participants had DAST-20 scores suggesting previous dependency, extending from intermediate to severe levels ($N=39$; 67.24%). Regarding alcohol, over three-quarters of the sample ($N=44$; 75.86%) had AUDIT scores ≥ 8 , indicating past risky alcohol consumption. Of these, more than half of participants ($N=35$; 60.34%) reported past alcohol use at dependency levels with AUDIT scores ≥ 20 .

Table 10**Outcome variables by gender and for total group for past substance use**

	Male PD Service (<i>n</i> =31)	Women's Service (<i>n</i> =27)	Whole Sample (<i>N</i> =58)
DAST-20 (drugs) total			
Mean (<i>SD</i>)	7.74 (5.07)	9.04 (3.66)	8.34 (4.48)
Median (Range)	6.00 (2-17)	9.00 (2-19)	8.50 (2-19)
AUDIT (alcohol) total			
Mean (<i>SD</i>)	18.71 (13.87)	24.41 (11.55)	21.36 (13.05)
Median (Range)	23.00 (0-37)	29.00 (1-40)	25.50 (0-40)

DAST-20 (drugs) severity total (%)			
1-5 (low)	14 (45.16)	5 (18.52)	19 (32.76)
6-10 (intermediate)	4 (12.90)	15 (55.56)	19 (32.76)
11-15 (substantial)	11 (35.48)	5 (18.52)	16 (27.59)
16-20 (severe)	2 (6.45)	2 (7.41)	4 (6.90)
AUDIT (alcohol) risk level total (%)			
0-7 (low risk)	11 (35.48)	3 (11.11)	14 (24.14)
8-15 (hazardous)	2 (7.41)	4 (14.81)	6 (10.34)
16-19 (harmful)	1 (3.23)	2 (7.41)	3 (5.17)
≥20 (almost certainly dependent)	17 (54.84)	18 (66.67)	35 (60.34)
Substance Use Severity Scale total (drugs and/or alcohol) (%)			
Non-problematic 0	7 (22.58)	1 (3.70)	8 (13.79)
Mild 1	1 (3.23)	4 (12.90)	5 (8.62)
Moderate 2	2 (6.45)	3 (11.11)	5 (8.62)
Serious 3	13 (22.41)	16 (59.26)	29 (50.00)
Severely problematic 4	8 (25.81)	3 (11.11)	11 (18.97)

Findings from the Substance Use Severity Scale found that half of the participants had had serious problems with substances (alcohol and/or drugs) ($N=29$; 50.00%) with a further 18.97% ($N=11$) having had severely problematic use. Only 8 participants (13.79%) reported usage deemed non-problematic, 7 (22.58%) males and 1 (3.70%) female. This finding just failed to reach significance (Fisher's exact $p=.057$). There were no other significant gender differences regarding severity level of past substance use.

Hypothesis 1

In MDOs, higher levels of past trauma exposure will be associated with higher levels of past substance use.

The relationship between overall severity of past substance use measured by the Substance Use Severity Scale, and previous amount of past trauma exposure as per the LEC-5, was investigated using Pearson product-moment correlation coefficient. Table 11 shows there was a positive correlation between the two variables, of a moderate

effect size, $r=.30$, $N=58$, $p<.05$, with greater levels of past trauma exposure associated with higher levels of past gross severity of substance use.

Table 11
Pearson product-moment correlations between past Substance Use Severity and past trauma exposure (LEC-5)

	Substance Use Severity		
	Male PD Service ($n=31$)	Women's Service ($n=27$)	Whole Sample ($N=58$)
LEC-5	.29	.31	.30*

* $p<.05$ (two-tailed)

No gender differences were found regarding the relationship between severity of past substance use, and historic trauma.

Psychological Sequelae of Trauma:

Participants had on average three areas of trauma-related symptomatology, which reached clinical levels of disturbance (Table 12). There were no gender differences in trauma-related symptomatology levels.

Table 12
TSI-2 clinical scales totals by gender and for total group

TSI-2 number of clinical scales	Male PD Service ($n=30$)	Women's Service ($n=27$)	Whole Sample ($N=57$)
Not clinically significant ($T<60$) Mean (SD) Median (Range)	7.37 (3.93) 7.00 (1-12)	6.48 (3.81) 8.00 (1-12)	6.95(3.87) 7.00 (1-12)
Problematic ($T=60-64$) Mean (SD) Median (Range)	1.63 (1.50) 1.00 (0-4)	1.70 (1.30) 2.00 (0-5)	1.67 (1.39) 2.00 (0-5)
Clinically elevated ($T\geq 65$) Mean (SD) Median (Range)	3.00 (3.48) 1.50 (0-11)	3.81 (3.25) 3.00 (0-11)	3.39 (3.37) 3.00 (0-11)

Table 13 is presented below, which refers to the results found for the TSI-2 factor *T*-scores, and the clinical scale and subscale *T*-scores related to anxiety and depression. These are specified by gender and for the entire cohort.

Table 13
Outcome variables by gender and for total group for current trauma-related symptoms (TSI-2)

TSI-2 Factor <i>T</i>-Scores	Male PD Service (<i>n</i>=30)	Women's Service (<i>n</i>=27)	Whole Sample (<i>N</i>=57)
Self-Disturbance Mean (<i>SD</i>) Median (Range) # Clinically elevated (%)	58.97 (11.23) 57.50 (40-80) 9 (30.00)	57.63 (9.58) 56.00 (38-75) 8 (29.63)	58.33 (10.41) 56.00 (38-80) 17 (29.82)
Posttraumatic Stress Mean (<i>SD</i>) Median (Range) # Clinically elevated (%)	59.63 (11.01) 59.00 (36-81) 9 (30.00)	62.11 (9.78) 62.00 (43-81) 11 (40.74)	60.81 (10.43) 59.00 (36-81) 20 (35.09)
Externalisation Mean (<i>SD</i>) Median (Range) # Clinically elevated (%)	57.57 (14.61) 54.00 (39-99) 8 (29.63)	60.30 (12.00) 58.00 (42-83) 11 (40.74)	58.86 (13.39) 56.00 (39-99) 19 (33.33)
Somatisation Mean (<i>SD</i>) Median (Range) # Clinically elevated (%)	48.83 (9.56) 49.00 (33-76) 2 (6.67)	51.89 (11.63) 52.00 (32-78) 3 (11.11)	50.28 (10.61) 51.00 (32-78) 5 (8.78)
TSI-2 Clinical Scale <i>T</i>-Scores			
Anxious Arousal Mean (<i>SD</i>) Median (Range) # Clinically elevated (%)	57.80 (10.15) 58.00 (35-80) 7 (23.33)	57.07 (8.25) 57.00 (42-77) 4 (14.81)	57.46 (9.23) 57.00 (35-80) 11 (19.30)
Depression Mean (<i>SD</i>) Median (Range) # Clinically elevated (%)	59.40 (11.61) 59.00 (41-78) 13 (43.33)	58.44 (9.52) 59.00 (39-71) 9 (33.33)	58.95 (10.59) 59.00 (39-78) 22 (38.60)
TSI-2 Clinical Subscale <i>T</i>-Scores			
Anxiety Mean (<i>SD</i>) Median (Range) # Clinically elevated (%)	58.73 (9.29) 59.50 (37-77) 7 (23.33)	58.67 (7.78) 59.00 (43-75) 5 (18.52)	58.70 (8.53) 59.00 (37-77) 12 (21.05)

As Table 13 shows, participants were affected by problematic levels of current trauma-related Posttraumatic Stress symptoms; this TSI-2 factor yielded the highest *T*-score ($M[SD]=60.81[10.43]$). No other mean TSI-2 factor, clinical scale, or clinical subscale *T*-scores exceeded the 60 cut-off to meet problematic levels. However, as can be seen,

a clinically elevated level of Depression affected more than one-third of participants ($N=22$; 38.60%) whilst a similar amount suffered with current Posttraumatic Stress ($N=20$; 35.09%).

An independent-samples T -test was carried out to compare the TSI-2 factor, clinical scale, and clinical subscale T -scores for men and women participants. There were no significant gender differences found.

Relationship Between Past Trauma and Substance Use, and Current Trauma-Related Symptoms:

Several correlations were performed to explore relationships between severity of past trauma delineated by the LEC-5 and severity of past drug and alcohol use (identified using the DAST-20, AUDIT, and Substance Use Severity Scale), and current trauma-related symptoms measured by the TSI-2.

Relationships between past level of past trauma, and current trauma-related distress are tabled below.

Table 14
Pearson product-moment correlations between past trauma exposure (LEC-5) and current trauma-related symptoms (TSI-2)

	LEC-5		
	Male PD Service ($n=30$)	Women's Service ($n=27$)	Whole Sample ($N=57$)
TSI-2 Factor T-Scores			
Self-Disturbance	.135	.308	.203
Posttraumatic Stress	.107	.353	.233
Externalisation	.158	.262	.213
Somatisation	.351	.199	.280
TSI-2 Clinical Scale T-Scores			

Anxious Arousal	.036	.050	.037
Depression	.148	.157	.143
TSI-2 Clinical Subscale T-Scores			
Anxiety	-.046	.070	.006

As shown in Table 14 overhead, there were no significant relationships found between experience of traumatic life events (as measured by the LEC-5), and current trauma-related symptoms (as per the TSI-2 results), either for the whole sample or for male and female participants discretely.

The relationship between past drug use severity, as determined by the DAST-20, and current trauma-related symptoms as per the administration of the TSI-2, was explored by means of the Spearman Rank Order Correlation (Table 15). There was a positive relationship found between the two variables for the total sample of a small effect size, with respect to current symptoms related to Posttraumatic Stress, $\rho = .27$, $N = 57$, $p < .05$, with higher levels of past drug use associated with higher levels of current Posttraumatic Stress.

Table 15
Spearman correlations between severity of past drug use (DAST-20) and current trauma-related symptoms (TSI-2)

	DAST-20		
	Male PD Service (n=30)	Women's Service (n=27)	Whole Sample (N=57)
TSI-2 Factor T-Scores			
Self-Disturbance	.079	.290	.172
Posttraumatic Stress	.138	.357	.272*
Externalisation	.027	.389*	.180
Somatisation	.152	.269	.191
TSI-2 Clinical Scale T-Scores			
Anxious Arousal	.138	.243	.198
Depression	.019	.192	.106

TSI-2 Clinical Subscale T-Scores			
Anxiety	.078	.285	.174

* $p < .05$ (two-tailed)

Only one gender difference was unearthed; it was found there was a positive correlation, of a moderate effect size, for female participants between severity of past drug use and current symptoms concerning Externalisation, $\rho = .39$, $n = 27$, $p < .05$, with greater levels of past drug usage related to higher elevated levels of Externalisation.

The relationship between historical severity of alcohol use, as measured by the AUDIT, and recent trauma-related symptoms, as gauged by the TSI-2, was considered using the Spearman Rank Order Correlation (Table 16). Regarding the TSI-2 factor T-scores, the only significant finding was concerning male participants; there was a positive correlation, of a moderate effect size, between seriousness of past alcohol consumption for men and current symptoms related to Self-Disturbance, $\rho = .40$, $n = 30$, $p < .05$, with greater levels of past alcohol use related to higher levels of current Self-Disturbance.

Table 16
Spearman correlations between severity of past alcohol use (AUDIT) and current trauma-related symptoms (TSI-2)

	AUDIT		
	Male PD Service ($n = 30$)	Women's Service ($n = 27$)	Whole Sample ($N = 57$)
TSI-2 Factor T-Scores			
Self-Disturbance	.396*	-.045	.199
Posttraumatic Stress	.346	.075	.246
Externalisation	.261	.124	.177
Somatisation	.079	.256	.148
TSI-2 Clinical Scale T-Scores			
Anxious Arousal	.380*	.109	.266*
Depression	.298	-.096	.132

TSI-2 Clinical Subscale T-Scores			
Anxiety	.430*	.129	.307*

* $p < .05$ (two-tailed)

As for the TSI-2's clinical scale and subscale *T*-scores, there was a positive correlation for the total sample, of a small effect size, between seriousness of past alcohol use and Anxious Arousal, $\rho = .27$, $N = 57$, $p < .05$, along with Anxiety (moderate effect size) $\rho = .31$, $N = 57$, $p < .05$, with greater levels of past alcohol use associated with higher levels of current Anxious Arousal, and Anxiety.

Concerning findings for males and females separately, there was a positive correlation between Anxious Arousal and past alcohol use, of a moderate effect size, for just male participants, $\rho = .38$, $n = 30$, $p < .05$, with greater levels of past alcohol usage associated with higher levels of current Anxious Arousal. Likewise, there was a significantly positive relationship found between past alcohol consumption and current Anxiety, for only men, of a moderate effect size, $\rho = .43$, $n = 30$, $p < .05$, with greater past alcohol use linked to higher levels of current Anxiety.

The relationship between gross severity of past substance use as measured by the Substance Use Severity Scale, and current trauma-related symptoms, gauged by the TSI-2, was explored using Pearson product-moment correlation coefficient (Table 17). For the total sample, positive correlations with moderate effect sizes were found between past Substance Use Severity and current TSI-2 factors of Self-Disturbance, $r = .31$, $N = 57$, $p < .05$, and Posttraumatic Stress, $r = .38$, $N = 57$, $p < .01$, the Anxious Arousal clinical scale, $r = .41$, $N = 57$, $p < .01$, and the Anxiety subscale, $r = .45$, $N = 57$, $p < .01$, with higher levels of past substance use associated with greater levels of current Self-Disturbance, Posttraumatic Stress, Anxious Arousal, and Anxiety.

Table 17

Pearson product-moment correlations between past Substance Use Severity and current trauma-related symptoms (TSI-2)

	Substance Use Severity		
	Male PD Service (<i>n</i> =30)	Women's Service (<i>n</i> =27)	Whole Sample (<i>N</i> =57)
TSI-2 Factor T-Scores			
Self-Disturbance	.419*	.115	.310*
Posttraumatic Stress	.460*	.242	.380**
Externalisation	.261	.125	.215
Somatisation	.277	.258	.259
TSI-2 Clinical Scale T-Scores			
Anxious Arousal	.493**	.248	.408**
Depression	.311	-.056	.185
TSI-2 Clinical Subscale T-Scores			
Anxiety	.516**	.315	.445**

**p*<.05 (two-tailed)

***p*<.01 (two-tailed)

Concerning the genders, only men's past Substance Use Severity was correlated with current trauma-related symptoms with moderate effect sizes for the TSI-2's factors of Self-Disturbance, $r=.42$, $n=30$, $p<.05$, and Posttraumatic Stress, $r=.46$, $n=30$, $p<.05$, and the Anxious Arousal clinical scale, $r=.49$, $n=30$, $p<.01$, with higher levels of past substance usage connected with elevated levels of current Self-Disturbance, Posttraumatic Stress, and Anxious Arousal. Furthermore, a large effect size was found for the Anxiety clinical subscale for male participants, $r=.52$, $n=30$, $p<.01$, with greater levels of past substance usage connected with a higher degree of current Anxiety.

Variables Associated With Current Trauma-Related Symptoms:

To examine which variables impacted upon participants' current trauma-related symptomatology (Table 18), regression analyses (entry method) were performed with

recent trauma-related psychological disturbance as the dependent variable (TSI-2 Self-Disturbance and Posttraumatic Stress factor scores, Anxious Arousal and Depression clinical scales, and the Anxiety subscale). Gender, length of admission, past Substance Use Severity, and the degree of past trauma exposure were included as independent variables.

Hypothesis 2

In MDOs, higher levels of past substance use will be associated with higher levels of current trauma-related anxiety and depression, once previous trauma exposure has been controlled for.

Only past Substance Use Severity was a significant predictor of Self-Disturbance ($T=2.01$, $p=.05$). For every one-point increase in Substance Use Severity, Self-Disturbance scores increased by 2.26 points, and together the four independent variables accounted for 5% of variance in the Self-Disturbance scores ($R^2=.05$). Similarly, severity of previous substance use significantly predicted current levels of Posttraumatic Stress ($T=2.56$, $p=.01$), Anxious Arousal ($T=3.23$, $p=.002$), and Anxiety ($T=3.66$, $p=.001$); with each increase of one-point in Substance Use Severity, Posttraumatic scores increased by 2.78 ($R^2=.12$), Anxious Arousal results rose by 3.11 ($R^2=.11$), whilst Anxiety escalated by 3.19 ($R^2=.15$).

Table 18
Summary of multiple regression analyses (entry method) for variables predicting participants' current trauma-related symptoms (N=57)

	B (CIs)	β	t	p	Adjusted R ²
TSI-2 Factor T-Score Self-Disturbance					
Gender	-1.70 (-7.28-3.88)	-.08	-.61	.54	
Length of admission	.01 (-.04-.05)	.03	.24	.81	
Substance Use Severity	2.26 (.003-4.51)	.27	2.01	.05	
Past trauma	.66 (-.55-1.88)	.15	1.10	.28	.05
TSI-2 Factor T-Score Posttraumatic Stress					
Gender	2.32 (-3.09-7.72)	.11	.86	.39	
Length of admission	.01 (-.03-.06)	.08	.60	.55	
Substance Use Severity	2.78 (.60-4.97)	.34	2.56	.01	
Past trauma	.65 (-.53-1.83)	.15	1.11	.27	.12
TSI-2 Clinical Scale T-Score Anxious Arousal					
Gender	-.69 (-5.45-4.11)	-.04	-.29	.77	
Length of admission	.003 (-.04-.04)	.02	.13	.90	
Substance Use Severity	3.11 (1.18-5.05)	.42	3.23	.002	
Past trauma	-.24 (-1.29-.80)	-.06	-.47	.64	.11
TSI-2 Clinical Subscale T-Score Anxiety					
Gender	.11 (-4.22-4.45)	.01	.05	.96	
Length of admission	.01 (-.03-.04)	.03	.27	.79	
Substance Use Severity	3.19 (1.44-4.94)	.47	3.66	.001	
Past trauma	-.39 (-1.33-.56)	-.11	-.82	.41	.15
TSI-2 Clinical Scale T-Score Depression					
Gender	-.85 (-6.72-5.03)	-.04	-.29	.77	
Length of admission	.02 (-.03-.07)	.10	.73	.47	
Substance Use Severity	1.24 (-1.13-3.61)	.15	1.05	.30	
Past trauma	.57(-.71-1.85)	.13	.89	.38	-.02

There was no association found between current trauma-related Depression, and Substance Use Severity.

To examine potential gender differences in the relationship between Substance Use Severity and current trauma-related symptoms, exploratory regression analyses (stepwise method) were conducted separately for females and males with trauma-related symptoms as the dependent variables and admission duration, Substance Use Severity, and past trauma were the independent variables.

For women there were no relationships between past Substance Use Severity and current trauma-related symptoms. For men, however, previous Substance Use Severity was a significant predictor of current trauma-related Self-Disturbance ($T=2.44$, $p=.02$), Posttraumatic Stress ($T=2.74$, $p=.01$), Anxious Arousal ($T=3.00$, $p=.01$), and Anxiety ($T=3.19$, $p=.004$); for every one-point increase in Substance Use Severity, Self-Disturbance scores increased by 3.23 points accounting for 15% of variance in the Self-Disturbance scores ($R^2=.15$) whilst Posttraumatic Stress scores increased by 3.48 points ($R^2=.18$), Anxious Arousal by 3.44 ($R^2=.22$), and Anxiety scores by 3.29 points ($R^2=.24$). No other variables entered once Substance Use Severity was controlled for (Table 19).

Table 19
Summary of multiple regression analyses (stepwise method) for variables predicting male participants' current trauma-related symptoms ($n=30$)

	B (CIs)	β	t	p	Adjusted R^2
TSI-2 Factor T-Score Self-Disturbance Substance Use Severity	3.23 (.52-5.94)	.42	2.44	.02	.15
TSI-2 Factor T-Score Posttraumatic Stress Substance Use Severity	3.48 (.88-6.08)	.46	2.74	.01	.18
TSI-2 Clinical Scale T-Score Anxious Arousal Substance Use Severity	3.44 (1.09-5.79)	.49	3.00	.01	.22
TSI-2 Clinical Subscale T-Score Anxiety Substance Use Severity	3.29 (1.18-5.41)	.52	3.19	.004	.24

Discussion

More than two-thirds of participants had had serious drug and/or alcohol problems in the past. All participants reported at least two traumatic events in their lifetime with an average exposure of seven incidents, and rates of trauma-related stress were high in this group with participants having an average of three TSI-2 clinically elevated clinical

scales. Even though men were older and had had longer admissions, there were no significant gender differences in past number of traumatic events, past substance misuse, or current levels of trauma-related stress.

There was a moderate association between level of past trauma and severity of past substance misuse ($r=.30$) with similar correlations for men and women (Hypothesis 1). Greater severity of previous substance misuse was independently associated with greater levels of current trauma-associated distress including greater Self-Disturbance (relative unstable, ongoing model of self/identity combined with disturbed relationships with others), and greater Posttraumatic Stress (Hypothesis 2). However, separate regressions showed that these expected relationships only held for male MDOs ($n=30$), and for female MDOs ($n=27$) there was no evidence that level of previous substance misuse was associated with current trauma-related stress.

Trauma Prevalence:

This experience of multiple trauma accords with previous research with offenders and forensic inpatient populations. For example, Karatzias et al. (2018) described that their sample of incarcerated women had reported a mean of 4.96 ($SD=2.81$) traumatic life events, Calvert, Larkin, and Jellicoe-Jones' (2008) investigation found a mean number of 4 ($SD=2.63$) traumas in their sample of 34 male inpatients detained in secure services whilst Garieballa et al. (2006) found a mean number of 5 ($SD=2.15$) traumas experienced by 31 German and Sudanese male forensic patients. However, the present study's participants experienced comparatively higher levels of traumatic events. This may be reflective of the select nature of the study's sample with patients detained in high security who, by definition, have more complex and greater risks and needs related to trauma and substance misuse. This concurs with other research with a select group of participants receiving treatment for comorbid substance misuse and PTSD,

which found patients had experienced trauma exposure to an average of six events ($SD=1.7$) (Barrett, Mills, & Teesson, 2011).

Notably, a complexity in determining prevalence rates for trauma is that diagnostic tools can lack sensitivity in reliably accounting for repeated exposure to each form of trauma; for example, being the victim of a physical assault more than once. The measures focus instead on victimisation amidst several distinct incidents. Therefore, it is not possible to postulate on the wider impact that cumulative trauma may have on participants with the data gleaned from the LEC-5. Nevertheless, it is plausible that the variety of events the LEC-5 details are unlikely to have been suffered as discrete experiences e.g. a person may have sustained a life-threatening injury as a victim of a physical assault where a weapon was used. As experiencing multiple traumas is commonplace amongst offenders (Karatzias et al., 2018), endeavouring to differentiate between participants who have undergone acute vis-à-vis chronic trauma is of limited value.

Given the generally higher trauma prevalence rates for forensic inpatients suffering multiple traumas (Calvert et al., 2008; Karatzias et al., 2018; Spitzer et al., 2001), and the range of traumas the LEC-5 cites, participants' high levels of past trauma is arguably an anticipated finding. However, the results may in fact underestimate the 'true' frequency of trauma experienced by forensic patients as it is acknowledged that more seriously traumatised persons are more likely to refrain from participating in trauma-related research, thus potentially reducing prevalence figures (Spitzer et al., 2011). Additionally, the LEC-5 is a self-report measure with the usual inherent biases related to social desirability with under-reporting possible, along with over-reporting or exaggerating of experiences, which offenders with substance misuse issues may do to rationalise behaviours (Widom, Weiler, & Cottler, 1999). This caveat, in the context of

the study's small sample size, begets due attention should be exercised when interpreting and generalising the results.

The study also found no significant gender differences concerning the number of lifetime traumatic events experienced. This outcome is at odds with previous research findings, including Chapter 2's systematic review, which have demonstrated higher trauma prevalence rates for women (e.g. Long et al., 2008; Saxena et al., 2016). On scrutiny of these investigations, Long et al.'s (2008) source emanated from dated work, albeit using a large randomised sample ($N=1,376$), drawn from the community in Dunedin, New Zealand using a postal questionnaire, which raises data generalisability issues (Mullen, Martin, Anderson, Romans, & Herbison, 1993). Moreover, Long et al. (2008) referenced Davenport (2004) but Davenport's source was Mullen et al. (1993). Saxena et al. (2016) cited Columbia University's Center on Addiction and Substance Abuse's (CASA's) 2010 investigation analysing data involving federal prisoners; hence the nature of CASA's sample limits the extension of their findings to a high-risk MDO sample situated in the UK. Therefore, the conflicting findings of the study vis-à-vis commonly reported results may reflect the highly select sample.

Given men are generally less likely to report abuse, especially sexual abuse in view of the greater stigma men feel acknowledging being victimised, the figures for the male participants may actually be higher (Cosden, Larsen, Donahue, & Nylund-Gibson, 2015; Roberts, Watlington, Nett, & Batten, 2010). Conversely, persons are more likely to acknowledge trauma exposure as sobriety is maintained; hence it is possible the trauma reported is an actual reflection of experience given the unique, enforced abstinence high secure environment (Cosden et al., 2015; Morris & Moore, 2009). Nonetheless, outcomes related to past trauma for the genders must be interpreted with caution.

Despite that, the strong relationships between trauma and criminality, mental disorder, and substance misuse evidenced in the forensic literature (Ardino, 2012; Barrett et al., 2011) lend credibility to the prevalence rates found. As well, the aforementioned reluctance of men to report maltreatment, especially sexual abuse, suggests the current study's findings are not an overestimate. The specific traumas reported by participants were not analysed discretely, hence the prevalence of different types cannot be itemised to draw inferences, however.

Although mainly men have been concentrated upon in the substance misuse literature (Covington, 2008), trauma-related assessment and treatment, especially for male offenders, has not been sufficiently explored and is often excluded as a focal point for therapy and recovery (Messina et al., 2007; Wolff & Shi, 2012). This gender bias regarding overlooking male offenders' experiences of trauma may be a contributing factor in inferring that the trauma prevalence of men reported in the present study is an under-representation; indeed, a literature review on childhood sexual abuse revealed sexual abuse in men is common, under-reported, under-recognised, and under-treated (Holmes & Slap, 1998). The current study's data fits with this in that none of the male participants had a formal PTSD diagnosis recorded while approximately one-quarter of women did ($n=8$; 25.81%), despite reported multiple trauma exposure and similar TSI-2 scores regarding current trauma-related symptoms being commonplace for both genders. However, this must be viewed within the overall backdrop of epidemiologic research consistently reporting only a small subgroup of trauma victims succumb to PTSD (Breslau, 2002).

Substance Use:

More than two-thirds of participants met the DSM-5's criteria for substance use disorder with a considerable proportion of these (34%) meeting the benchmark for substantial

or severe previous substance misuse problems. Regarding alcohol, nearly half of the sample met the criterion for dependency. Overall, the Substance Use Severity Scale's data showed a high percentage of participants had problematic historical substance use (86.21%).

While research with the high-risk forensic inpatient population is scant, the results from the current study concur with previous findings evidencing the generally high prevalence of past substance misuse issues in patients detained in high security. For example, Cappai et al. (2017) found in their sample of Broadmoor Hospital patients that almost 90% ($N=230$) had histories of substance misuse whilst D'Silva and Ferriter (2003), using admissions data from 1972 to 1998, found nearly 40% of patients detained in the three high security hospitals had used substances in the year preceding detention ($N=2,709$) although this figure was believed to underestimate true prevalence of use (McMurran, 2001). While power was capitalised given the investigations' large sample sizes, specific inferences cannot be drawn about gender as Cappai et al.'s (2017) study only included males, and D'Silva and Ferriter's (2003) original sample comprised only a small percentage of women (circa 13%).

Given the study's location houses the only national high secure hospital facility for high-risk women in the UK, the research provided a unique opportunity to investigate gender differences with high-risk inpatient MDOs. No differences were found, however, regarding past substance use, which is probably a manifestation of a highly particular group of high-risk women. Further, although the response rate was high, as previously noted, which results in improved generalisability to other high-risk populations, the relatively small sample size ($N=58$) limits the statistical power of the findings; besides, it is difficult to know if similar results would be obtained at other secure forensic units in the UK if the same methodology was applied, or indeed at other high-risk hospitals outwith the UK.

Although data were collected in regard to the specific substances the sample had used, imposed time restraints meant that type of substance in relation to trauma and psychological sequelae of trauma was not explored; nonetheless, the sample size may have hampered meaningful interpretations. As research indicates the self-medication hypothesis may be substance specific, with cannabis use being more strongly associated with exposure to violence than alcohol, for example, and different trauma symptoms related to different substances, investigating the interrelationships between specific substances and trauma is of value for future investigations (Dworkin et al., 2018; Wright, Fagan, & Pinchevsky, 2013).

Psychological Sequelae of Trauma:

Regarding experiencing current trauma-related psychological distress, the study found participants were experiencing clinically elevated levels of distress typically in three areas overall. No gender differences were revealed in level of distress. The findings indicated that Depression was the most frequently occurring with over one-third of the sample currently experiencing Depression-related morbidity ($N=22$; 38.60%) whilst Posttraumatic Stress was the next common with again, more than a third of participants suffering with this symptomatology ($N=20$; 35.09%). There were no gender variations found.

Although Cosden et al. (2015) found more women than men reporting clinical symptoms on TSI subscales, this may be due to men's reservations disclosing abuse, especially sexual abuse, as highlighted earlier. It may also be attributable to the nature of their sample, which was derived from two court-involved substance misuse treatment programmes wherein the present study's comprised high-risk detained MDOs with complex risks and needs; this may suggest MDOs are a relatively homogeneous

group with respect to degree of severity of past trauma exposure, and current psychological distress.

Though it may be argued the study's results show relatively low levels of current trauma-related psychological distress, particularly within the context of a high degree of past trauma exposure and multiple psychopathology diagnoses, it is important to consider the TSI-2 assesses distress suffered just in the preceding six-months. Given that the average period of detention for participants was just over 6-years (range 6-months to >23.5-years) (Table 8a), and therefore some time had passed since the last traumatic event for many participants, it is possible the therapeutic environment with a high level of medical, psychological, and other therapeutic input had a mitigating effect. Therefore, in studying the relationship between trauma and substance misuse, it was important to control for length of admission, but it may also have been beneficial to look at the recency of trauma exposure relative to current trauma-related distress.

Additionally, given that substance misuse is deemed a high-risk behaviour correlated with other high-risk behaviours thereby increasing the risk of trauma (high-risk hypothesis), is a result of trauma exposure (self-medication hypothesis), or both in a 'vicious circle' with higher rates for persons with a mental disorder diagnosis (Goodman et al., 2001), comparing recency of trauma exposure with current related stress could have indicated temporal correlates. Nonetheless, this study indicates support for the self-medication hypothesis, which is the hypothesis with the most well-established evidence base (Haller & Chassin, 2014).

The study did not find any significant relationships between exposure to past trauma and current psychological sequelae of trauma (Table 14). This is counterintuitive given the evidence base clearly demarcates the positive relationship between trauma exposure with multiple forms of psychopathology (McLaughlin & Lambert, 2017), which

is likewise reflected in the study's sample (see Table 8b). With participants' average current detention exceeding six-years, it may be the case that temporal distance from the traumatic event has a mediating effect with the therapeutic environment and relational security providing an additional buffer. Moreover, it is feasible the trauma measure utilised, the LEC-5, although used with this population before, is not particularly sensitive to the *nature* of the trauma exposure given that it assesses number of different traumas rather than magnitude or repetition of traumas.

Relationship With Past Drug Use:

In the group as a whole, it was found current Posttraumatic Stress was positively correlated with higher levels of substance misuse. Given that all participants reported a high amount of past trauma exposure, this finding accords with results of previous research indicating an association between number of traumatic life events and emergence of a DSM-5 PTSD diagnosis (Karatzias et al., 2018). The only gender difference discovered was that women's current Externalisation-related symptomatology was positively associated with greater past consumption of drugs. As the TSI-2's Externalisation factor includes suicidality and tension reduction behaviour, which comprises the tendency to externalise and/or reduce distress through self-injurious behaviour (Briere, 2011), this finding corresponds with previous research demonstrating female forensic inpatients exhibit high rates of self-harm, and if compared to men, more self-destructive behaviour (self-harm and suicidality) (de Vogel, Stam, Bouman, Ter Horst, & Lancel, 2016; Thomas et al., 2005). Generally, high secure women have higher prevalence rates of BPD and borderline traits (Logan & Blackburn, 2009), which may justify this gender difference though it is recognised that gender biases may exist in diagnostic practices wherein impulsivity is frequently interpreted as a borderline trait in women whilst for men it is typically labelled as antisocial (de Vogel et al., 2016). Although no differences in psychopathology for the

genders were found in the current study, this may reflect the small sample size.

Regardless, this finding fits with local clinical data that self-harm prevalence rates are higher in the women's care stream versus men's at the study's site.

Relationship With Past Alcohol Use:

The study's findings indicate that, generally, there is a relationship between past alcohol use severity and recent trauma-related symptomatology, which is congruent with existing research (Papastavrou, Farmakas, Karayiannis, & Kotrotsiou, 2011; Wiechelt et al., 2011) including Chapter 2's findings. The quantitative study further indicates this association seems to be particularly greater for men than women.

For past alcohol use severity, positive relationships between past seriousness of alcohol consumption and recent Anxious Arousal and Anxiety symptoms for the whole sample were found. Regarding gender differences, only men were discovered to have a significant, positive relationship between historic alcohol use severity and current Anxious Arousal and Anxiety with higher previous drinking levels associated with greater current Anxious Arousal and Anxiety. Additionally, a positive association was found with current Self-Disturbance for just male participants.

Given the Self-Disturbance factor consists of the Depression Scale, this may suggest a relationship between level of past alcohol use and current trauma-related depression for men only, supporting the aforementioned discussion on the self-medication and endorphin compensation hypotheses with alcohol specifically cited as improving trauma-related symptomology (Stewart et al., 1998). However, it seems to contradict the general finding that women are more predisposed to self-medicate to alleviate depression with respect to misusing alcohol at greater overall levels than males, and a link for women between problematic drinking and PTSD (Becker et al., 2012; Ullman,

Relyea, Peter-Hagene, & Vasquez, 2013; Volpicelli et al., 1999). This difference found may be a consequence of the study's highly select sample comprising a group deemed to be high-risk MDOs.

It may, moreover, be reflective of demonstrable differences concerning the patterns of comorbid substance misuse issues and mood disorders for the genders; as research suggests women are more likely to self-medicate for primary depression (depression manifesting prior to the development of substance misuse), while men are more likely to develop depression as a consequence of chronic alcohol use (secondary depression) (Pettinati & Plebani, 2009; Zilberman et al., 2002), the study's finding may be reflective of a distinction in *type* of depression, in which case the results accord with the evidence base that women more likely self-medicate for depression.

In general, these results indicate there is a relationship between past alcohol use severity and recent trauma-related symptomatology, which is congruent with existing research (Papastavrou et al., 2011; Wiechelt et al., 2011). The present study further indicates this association seems to be especially greater for men than women.

A noteworthy finding is the results suggest that for male MDOs, current trauma-related stress is linked to previous alcohol use whereas for female MDOs, present-day trauma-related stress is associated with past drug consumption. This gender difference could be a function of length of admission and corresponding age given men had a significantly longer admission duration and were older than their female counterparts (Table 8a). A recent systematic review exploring the *status quo* of mental disorder and substance use problems amongst older prisoners found overall older men and women offenders were more likely to use alcohol whilst younger prisoners were more likely to misuse illicit drugs (Haesen, Merkt, Imber, Elger, & Wangmo, 2019). Therefore, it may be possible the variation in substance – alcohol vis-à-vis drugs – is correlated with age,

and not connected to gender, with older MDOs more likely to have used alcohol than younger MDOs.

There were several positive relationships revealed between severity of past substance use and current trauma-related distress. For the whole sample, significant relationships were found for Self-Disturbance, Posttraumatic Stress, Anxious Arousal, and Anxiety with greater levels of past substance use associated with greater levels of current psychological problems related to these *T*-scores. Regarding gender differences, the results for men only indicated significant, positive relationships between past Substance Use Severity and current Self-Disturbance, Posttraumatic Stress, Anxious Arousal, and Anxiety.

These results do not support the evidence base that anxiety and depression are disproportionately prevalent in women than men with substance use disorders (Benishek et al., 1992; Bonomi et al., 2009; Light et al., 2013; Tucci et al., 2010). This is despite the role of age; other research suggests first onset of depressive and anxiety disorders are found to be significantly different for women than men yet only before menopausal age (Altemus, Sarvaiya, & Epperson, 2014; Faravelli, Scarpato, Castellini, & Sauro, 2013). Taking into consideration the current study's male participants were found to be significantly older than females ($T[52.32]=2.76, p=.008$, two-tailed)(equal variances not assumed), this contradicts the expectation that depression and anxiety levels would be higher for women participants, especially as they were generally pre-menopausal with an average age of 34-years-old ($SD=8.22$). This may lend further credence to the proposal that the causal factors are different for high-risk female MDOs contrasted with their male counterparts. It may also indicate the mediating role for men that substance use severity plays considering that among persons with chronic generalised anxiety, men are more likely to have comorbid alcohol and substance abuse

than women who have higher rates of comorbid mood and anxiety disorders (Altemus et al., 2014).

It is important within this discussion to recognise the role the secure hospital setting has with trauma including relevant symptomatology. A positive relationship for forensic psychiatric inpatients has been found between greater levels of past exposure to childhood physical and sexual abuse, with higher rates of seclusion and restraint (Hammer, Springer, Beck, Menditto, & Coleman, 2011). Trauma-informed practice would indicate that a consequence of using seclusion and restraint with inpatients with abuse histories would result in re-traumatisation because of the psychological associations between childhood trauma and the seclusion/restraint experience, which can lead to additional emotional and behavioural dysregulation, worsening emotional pain, and causing helplessness and fear (Hammer et al., 2011). These are important considerations for patient management, well-being, and recovery.

Given the large proportion of White British participants ($N=56$; 96.55%), this precluded any analyses related to culture or ethnicity though it is recognised that ethnic minorities are disproportionately represented in drug-related offending, and detention negatively impacts upon them (Sacks, 2004). The role of culture in relation to trauma should therefore be acknowledged. For example, culture can shape responses to traumatic events, along with the clinical parameters of diagnostic criteria in assessing psychological sequelae to trauma, and some cultures persistently encounter traumatic situations (Marsella, 2010). Moreover, high-risk MDOs are at risk of losing contact with family due to detention lengths and the geographical isolation of high secure hospitals; this is especially poignant for the study's female participants given the Women's Service is a national service, hence patients are more likely to be isolated from their communities, which can affect coping. Indeed, the United Nations Office on Drugs and

Crime (2016) underlines the importance of high-risk offenders being able to maintain outside contact with their communities as fundamental to recovery.

Hypothesis 1

In MDOs, higher levels of past trauma exposure will be associated with higher levels of past substance use.

As per Table 11 above, a positive correlation was found between severity of past substance use and past trauma exposure ($r=.30$, $N=58$, $p<.05$), which provides support for Hypothesis 1. This outcome corroborates the evidence base of the positive relationship between past trauma exposure and substance misuse issues (Keyser-Marcus et al., 2015; McLaughlin & Lambert, 2017; Saxena et al., 2016) although does not agree with the general conclusion that more women than men with substance misuse problems are likely to have experienced sexual and physical trauma (Briere & Elliott, 2003). Lack of gender disparity in the current study may be a function of the nature of the highly select sample, or could reflect how trauma was measured and defined given that the specific types of LEC-5 trauma were not analysed, just the overall extent.

This finding is commensurate with the self-medication hypothesis literature, postulating that persons misuse substances to cope with or avoid painful trauma-related symptoms, as discussed earlier. This is further compounded by cue reactivity given research evidencing that persons with comorbid substance misuse issues and PTSD experience increased cravings in response to personalised trauma-image cues and *in vivo* substance-related cues, which could be a contributory factor to the poorer substance misuse treatment outcomes recognised in this population (Coffey et al., 2002).

The role of resilience merits mentioning as it is an important feature of moderating trauma-related psychological sequelae. Given that its hallmarks relate to supportive relationships, a positive self-view, adaptive problem-solving skills, and capacity to regulate feelings and impulses, which are characteristic deficits in high-risk MDOs, it is likely resilience has not acted in the current sample to interrupt the trajectory from trauma-related risk to psychopathology.

Although the study found trauma history was not associated with current trauma-related symptomatology (Table 14), the findings showed past Substance Use Severity was a significant predictor of current trauma-related Self-Disturbance, Posttraumatic Stress, Anxious Arousal, and Anxiety. This lends some support to the established evidence base that a trauma history may increase the risk of persons with substance misuse problems to comorbid mental disorder, as discussed earlier, as well as current PTSD-related symptoms (Khoury et al., 2010; Zlotnick et al., 2008b). Further, the present study suggests relationships between trauma exposure and substance misuse, and their combined associations with PTSD-related symptomatology.

Hypothesis 2

In MDOs, higher levels of past substance use will be associated with higher levels of current trauma-related anxiety and depression, once previous trauma exposure has been controlled for.

Multiple regression analyses (entry method) were used to test Hypothesis 2. It was found that past Substance Use Severity was a significant predictor of current trauma-related Self-Disturbance, Posttraumatic Stress, Anxious Arousal, and Anxiety. There was no significant relationship found between previous severity of substance use and current Depression; hence Hypothesis 2 is partially supported. Regarding gender differences, exploratory regression analyses (stepwise method) discovered increased

past severity of substance use did not significantly predict current trauma-related anxiety and depression in women. It was found past Substance Use Severity was in fact a significant predictor of anxiety (as reflected in the TSI-2's Anxious Arousal clinical scale and Anxiety clinical subscale) for men, although depression was not.

Although these findings relating to the general association between current trauma-related symptomatology and substance misuse corroborate extant research, they do not support the established research base evidencing anxiety and depression are more prevalent in women with substance misuse issues (Keyser-Marcus et al., 2015; McDevitt-Murphy, Murphy, Monahan, Flood, & Weathers, 2010). This may be indicative of the highly selective nature of the present study's sample given that McDevitt-Murphy et al.'s (2010) participants were college students whilst Keyser et al.'s (2015) community sample was drawn from outpatients involved with substance abuse treatment.

Even though Hypothesis 2 is partially supported by the study's data, the research facilitates an understanding that the underlying mechanisms may be different and unique for high-risk female and male MDOs, particularly if compared to other populations. Moreover, it concurs with the notion that problems for female MDOs seem to be even more complex and multi-faceted than those for male MDOs (de Vogel et al., 2016), suggesting a highly specialised intervention is required. This provides sound rationale for the qualitative component of the study whereby it was specifically explored with female participants how they perceive the relationship between their past substance misuse, and trauma exposure. The results of this exploratory component will be the focus of the next chapter.

It is recognised the study found past trauma exposure, as measured by the LEC-5, correlated positively with previous substance use severity (Hypothesis 1), whilst past

substance use severity had a positive association with current trauma-related anxiety symptoms as per the TSI-2 (Hypothesis 2); however, the results indicated past trauma rates were not correlated with current trauma-related distress. This may be attributable to the measurement tools. As noted earlier, the LEC-5 is not sensitive regarding the quality of the trauma (e.g. magnitude or recurrence); it just measures the range of traumas experienced.

Strengths and Limitations:

The TSI-2 was used because of the study's trauma focus and its advantages as per Chapter 3, including its clinical utility measuring a wide range of posttraumatic symptomatology; thus permitting several trauma-related factors be taken into account when identifying the treatment needs of the participants. The study found positive relationships for men's past severity of alcohol use and past Substance Use Severity with current trauma-related Anxious Arousal and Anxiety with higher levels of previous usage associated with greater current anxiety-related distress levels. Whilst no significant relationships were found related to Depression, there were positive correlations detected concerning the Self-Disturbance factor, which is comprised of three clinical scales including Depression; male participants' past alcohol use severity, and previous Substance Use Severity was found to be positively associated with increased levels of current trauma-related Self-Disturbance. However, a limitation regarding these findings is the Depression clinical scale, the Anxious Arousal clinical scale, and the Anxiety subscale discretely are not sensitive enough to discriminate between either trauma-related depression or anxiety *per se* and so the findings may be symptomatic of other diagnoses such as major depressive disorder and generalised anxiety disorder. Furthermore, the Self-Disturbance and Trauma factor scores, relevant to Depression and Anxious Arousal/Anxiety respectively, represent a constellation of symptoms, which are typical of trauma-related distress but are not standalone

indicators. Arguably the analyses should have been confined to the factor scores, which more strongly reflect posttraumatic distress.

Additionally, a further limitation of the study involves the method of analyses. Multiple testing has the potential to increase Type I errors that can arise when statistical tests are employed repeatedly, and so may explain the significant relationships found. It may have been prudent to employ the Bonferroni correction technique or instead to have limited the analyses to the TSI-2's factor scores.

A key limitation of correlational research is that direction of causation cannot be inferred as other mitigating variables may exist. Given that the intervening period between past substance use and interview could be several years, retrospective assessment may be problematic due to recanting. Participants were asked to recall previous drug use from an abstinent perspective; hence as they have matured, an increasing awareness of the social unacceptability of addiction may have developed, and they may be less likely to admit engaging in stigmatised behaviour, notwithstanding the influence of memory processes (Martino, McCaffrey, Klein, & Ellickson, 2009). Equally, participants' sober status may have provided them with an obscured interpretation about past addiction, overestimating how much substances alleviated trauma-related distress as a means of rationalising past use to reduce cognitive dissonance (Festinger, 1962).

Regarding potential memory issues, it is not possible to gauge the effects, often damaging, that previous substance misuse may have had on the brain, particularly the prefrontal cortex. This area of the brain is responsible for controlling emotion but is also connected to other regions responsible for regulating neurotransmitters (serotonin, dopamine, norepinephrine) central to mood regulation. These changes can continue long after substance misuse ceases. Overall, these potential confounders make it

difficult to disentangle the different factors contributing to the findings though provides sound justification for studying women separately using a qualitative method to really understand their experience (Chapter 5).

Another shortcoming of this study is that there is insufficient data available to corroborate the timing of the trauma, trauma symptoms, and substance use histories. Given the retrospective nature of reporting trauma exposure along with past substance use, recall bias in patients' subjective reports is also possible. However, it has been found that the basic information related to events tends to be reliable and stable over time with retrospective reporting; problems are more likely to arise when individuals try to recall specific details of the event(s) so this bias may be limited in the current study (Grover et al., 2007).

This study reported all participants experienced a minimum of two incidents of lifetime trauma with a mean number of seven traumatic life events, which is generally supported by other research with forensic inpatients although the same limitations with retrospective measures apply (Gariebballa et al., 2006). However, the choice of trauma measure utilised in this study may also have influenced the results. The LEC-5 lists potential events that could result in trauma. Research has shown that a core methodological issue with using a list format for ascertaining trauma prevalence, instead of a single question design, yields higher prevalence estimates of trauma exposure and higher estimations of the average number of traumas reported per exposed person (Breslau, 2002).

Moreover, given the sensitive nature of the variables being investigated, especially trauma history and illegal substance misuse, some participants may have been reticent to disclose. As the researcher was already known to most participants within a therapeutic milieu that encourages transparency, this seemingly mitigated the risk.

Furthermore, the high secure environment is distinctively able to afford a safe, abstinence-based milieu. Although not completely sterile, given the use of prescribed medication and prospect of paralleling behaviours, the high secure hospital removes drug intoxication, improving participants' ability to acknowledge issues and report accurately. As well, patients are subject to random mandatory drug screening commensurate with hospital policy; all participants' tests during the study period were negative. Notwithstanding the safe, enforced abstinence of the high secure environment where compliance is custom, the prospect of testing for substance use is doubtless a further deterrent. Sobriety increases clarity of recall and reporting, along with ensuring the influence of substances is not a confounder.

Another limitation concerns the sample, which was derived from a non-probability sampling method based on a purposive sample of a highly select group of patients detained in one high secure hospital, and hence may yield an unrepresentative sample. This may restrict the generalisability and validity of the findings to other populations although it is recognised the study's main aim was to determine the needs of this highly specific cohort, and the uniqueness of the sample is underlined by the fact that there is only one UK secure hospital for high-risk women. A comparison group could not therefore be included in the present study.

As the data collected were generated from self-report, further potential disadvantages could include a small response rate. However, this was ostensibly minimised given the relatively high response rate ($N=58$; 74.36%); the relationship with the researcher, the institutional affiliation of the research, and its basis – the development of a treatment programme – may have been instrumental mediatory factors.

Another problem with surveys is lack of confidence the questions are understood or the intended respondent answered the question. Nonetheless, this should be low given the

known researcher and the method of test administration. All participants barring one ($N=57$) requested the researcher read aloud the questions, facilitating clarification of the questions when necessary.

The prevalence of Clusters A and C PD is markedly higher for male than female participants (45.16% versus 7.41%, and 54.84% versus 3.70% respectively) but this is unlikely to explain the association between past substance use severity, and current trauma-related distress. Rates of Cluster B were similar, which is a strength given that Cluster B personality disorders are of most relevance to trauma and substance misuse (Trull, Jahng, Tomko, Wood & Sher, 2010; Zhang, Chow, Wang, Dai, & Xiao, 2012).

A possible explanation for the correlations observed may be related to the high-risk hypothesis in that misusing substances increases the risk of trauma exposure. It may also be plausible that the extent of comorbidity between trauma and substance misuse, both with a great amount of symptom overlap, may be an artefact. This epiphenomenon may moreover manifest itself in reporting with participants inclined to provide high amounts of positive responses. Similarly, trauma and substance misuse may be by-products of other shared intrinsic neurobehavioural mechanisms (e.g. impulsivity) that predisposes them to both, which could be an influential factor related to the results (María-Ríos & Morrow, 2020). Again this supports the importance of a mixed methods approach to improve understanding, and to guide future research.

Additionally, participants' prescribed medications were not assessed; it is acknowledged that the effects, including side effects, of drug treatments on current trauma-related symptomatology, including anxiety and depression, is undetermined. Antidepressants, anxiolytics, mood stabilisers, and neuroleptics may have had a moderating influence on psychological sequelae assessed, and/or their utilisation may represent separate mental disorders (e.g. major depression, generalised anxiety disorder, mood disorders,

psychosis) erroneously ascribed as trauma-related psychological distress. In addition to the influence of medications, treatment response, which can be idiosyncratic, cannot be determined. However, since all of the participants were under the same service for their mental health, the impact of medication on the validity of the findings may be weaker than in community studies where treatment-seeking is another confounding factor.

Clinical Implications:

The aforementioned research by D'Silva and Ferriter (2003) concluded that from early 1970s to late 1990s, the number of MDOs with substance misuse issues had risen threefold; the present study supports more recent research with MDOs in high security, which suggests an equally drastic increase in the past two decades with nearly 90% of MDOs with problematic substance use (Cappai et al., 2017). The increasing prevalence rates in this population and high usage underscore the necessity for substance misuse treatment programmes in forensic services.

The study has shown that in addition to the pervasiveness of substance misuse issues in high-risk MDOs, they have experienced multiple traumas, and there is a positive correlation between the two. Although it is not possible to determine a direct causal relationship, this association suggests a robust and positive relationship between trauma exposure and substance misuse problems (Brady & Back, 2012). Also, past substance misuse severity was found to positively correlate to current trauma-related stress in the domains of Self-Disturbance, Posttraumatic Stress, Anxious Arousal, and Anxiety for the entire sample. Regarding gender differences, the results showed this relationship was significantly more manifested in men than women. Severity of substance use was not found to be associated with current Depression for the sample either jointly or discretely. These findings regarding psychopathology concerning

gender contrasts with the evidence base demonstrating higher rates of anxiety and depression in female offenders, suggesting the underlying mechanisms concerning these relationships are different for this highly select high-risk sample.

A recent systematic review has evidenced that trauma-focussed psychological interventions delivered alongside of substance misuse interventions can reduce trauma-related symptomatology, and drug/alcohol use (Roberts, Roberts, Jones, & Bisson, 2015). The current study's findings suggest the experience of multiple traumas may be the key to understanding better the substance misuse treatment needs for high-risk MDOs, and that attention should be given to the more specific trauma-related needs of this group (Karatzias et al., 2018).

It is further highlighted the trauma-related psychological sequelae, and its relationship to substance use severity, is revealed differently in men and women, reinforcing again the importance of an integrated intervention that also adopts a gender-responsive approach – for both men and women. It would therefore be important at the assessment stage to determine trauma-related psychological distress and its association with substance use. This integrated, complementary approach, which the literature amply supports (Cosden et al., 2015), is further reflected in the common goals of therapy; that is, replacing impulsive behaviours with planned, goal-oriented ones, and managing intrusive trauma memories and the cravings sustaining substance misuse (Dass-Brailsford & Myrick, 2010). A review of gender differences in persons misusing substances reveals women are more likely to report lower levels of confidence in being able to resist using drugs in different situations, along with general goals (Pelissier & Jones, 2005); hence substance misuse treatment for this cohort should address issues associated with self-efficacy as it too is an important area in gender-responsive, trauma-informed treatment (Saxena et al., 2016).

Regarding assessment of trauma, there appears to be potential issues in determining prevalence rates, with the choice of psychometric test relevant. In addition to the usual limitations integral to self-report measures, assessing trauma is understandably a very sensitive area to explore, and there is an apparent gender bias with clinicians less likely to address trauma issues in men compared to women with the perceived risk of the Pandora's box phenomena higher (Draucker, 1999). This may be more prone to occur in offending populations where gender stereotypes are more pronounced. Nonetheless, ethical concerns relating to trauma-related discussions evoking distress in participants – of either gender – were not observed with the current study. Participants expressed a great degree of interest, which is reflective in the high response rate. This lends support to other research documenting that involvement does not re-traumatise individuals, and participants instead reap personal benefits such as an opportunity to share their story, develop insight, and potentially help others through increasing scientific knowledge (Griffin, Resick, Waldrop, & Mechanic, 2003; Newman, Risch, & Kassam-Adams, 2006).

Critique of Analysis:

In order to fully explore the relationships between past substance use, past trauma, and current trauma-related distress, multiple tests were carried out and repeated for males, females, and the whole group. This increases the chance of finding a statistically significant result (Type I error). It may have been appropriate to apply the Bonferroni correction to reduce the accepted p value. This is particularly important in large studies where even a small effect size can yield statistical significance. Arguably in this type of study it is important to pay attention to effect sizes (magnitude of r value). It is also advised to conduct multiple univariate tests prior to regression analysis to guide the selection of dependent variables. Furthermore, applying the Bonferroni correction would possibly have proven too stringent, and consequently would

have increased the likelihood of Type II errors given the limitations imposed by the sample size in this hard-to-reach population. This may have resulted in missing possible effects and dismissing genuinely important differences, which would be antithetical to the study's exploratory purpose. Moreover, the statistical tests were completed within the context of pre-planned hypotheses; again, adjustments would have resulted in sacrificing potential effects (Armstrong, 2014).

However, the use of multiple factors, clinical scales, and subscales from the TSI-2 can be criticised both conceptually and statistically. An alternative approach would have been to conduct a (M)ANCOVA with the factor scores as dependent variables (within subject factors), and gender as the between subjects factors with age and trauma as co-variates.

The *a priori* power analysis calculated that the study required at least 42 participants for satisfactory statistical power. This calculation was based on linear multiple regression (random model) with four independent variables and setting the power level at .80 and alpha at .05 with a medium effect size (.30). Existing data was not held on which to base a prediction for the model R^2 ; therefore, *post-hoc* tests using the actual sample size and observed R^2 would have produced a more accurate calculation of actual study power. This would be particularly important to ensure that small gender effects were not missed within the key analyses.

The Substance Use Severity Scale, as previously reported, provided a composite measure of the overall gross severity of past substance misuse. Although unvalidated, it was derived directly from validated assessments of problematic substance use (DAST-20 and AUDIT). Both of these tools have good sensitivity and specificity for identifying persons at risk of drug and alcohol misuse respectively, and combining them has been recommended (Young, Nakashian, Yeh, & Amatetti, 2006); hence the Substance Use

Severity Scale was used in some of the main analyses to determine its relationship to past trauma (as measured by the LEC-5), along with its association with current trauma-related symptoms (as per the TSI-2's findings). One measure reduced the number of analyses. Furthermore, a validated measure for overall problematic substance misuse was not available. It may have been useful to conduct a sensitivity analysis by repeating the analyses using the DAST-20 and AUDIT separately to see if the results changed, however.

Regression analyses (entry method) were performed to address Hypothesis 2 to assess which independent variables (gender, admission length, past Substance Use Severity, and extent of past trauma) effected participants' current trauma-related symptoms (dependent variables). The entry method is appropriate for hypothesis testing as it is more conservative, and reduces the chance of a Type I error. All variables were entered together to investigate how much variance each accounted for, and so that any effects attributable to gender were not missed.

Next, exploratory regression analyses (stepwise method) were carried out to look at the relationships between men and women separately. This method was used to investigate how substance use was associated with current trauma-related distress within males and females individually. Given the smaller sample sizes, it was important to try to reduce the risk of a Type II error and ensure the effective triangulation of the qualitative and quantitative data exploring the relationship between past substance use, trauma, and current trauma-related distress in female MDOs. Stepwise analysis is less conservative. Furthermore, the stepwise method was utilised because it is a useful exploratory tool, particularly when developing a model that can be tested with further research (Thayer, 2002).

The validity of the statistical approaches used in this Chapter are underpinned by the assumption that the independent variables are not highly linearly related.

Multicollinearity can occur in the case of an approximate relationship between two or more of the independent variables, making it problematic for the model to estimate the independent relationship between each independent variable and the dependent variable. Multicollinearity reduces the regression model's power to identify independent variables that are significant, and it renders it difficult to interpret the coefficients as they would become sensitive to minor changes. Scrutiny of the correlations between dependent variables suggests that multicollinearity was not a problem.

Conclusion:

The study has made an original contribution to the extant research base, investigating the relationship between trauma and substance misuse, and if gender differences exist with a highly select group of high-risk patients detained in hospital to determine their specific needs. Given the links between extensive past trauma exposure, offending, substance misuse, and experiencing current posttraumatic stress-related symptoms, such experiences may contribute to the extent and/or seriousness of substance misuse, and offending (Karatzias et al., 2018). The results of this study indicate greater awareness of comorbid trauma history and substance misuse in high-risk MDOs is vital to understanding the mechanisms of substance misuse along with improving risk and treatment outcomes for this population. The gender variances found suggests the importance of assessing differing needs of men and women who misuse substances flexibly (in a way that can change easily so as to adapt to their different circumstances) (Drapalski et al., 2009). Therefore, consideration should be given to more detailed assessments of trauma-related needs for MDOs, discretely for the genders, with the aims of both improving mental health and reducing offending behaviours (Karatzias et al., 2018). Close collaboration with patients, to establish treatment goals and

expectations, along with approach, will play a major role in determining the success of any programme, improving clinical outcomes and reducing recidivism (Dass-Brailsford & Safilian, 2017).

This was the foundation upon which the qualitative part of the study was based whereby women's experiences, and perceptions of the relationship between their past misuse of substances and trauma was investigated. The results of this component are presented in the ensuing chapter.

CHAPTER 5

QUALITATIVE INVESTIGATION EXPLORING HIGH-RISK FEMALE MDOs' PERCEPTIONS ABOUT THE RELATIONSHIP BETWEEN PAST TRAUMA AND SUBSTANCE MISUSE

Introduction

The qualitative study sought to better understand the circumstances adjoining trauma exposure and substance misuse for high-risk female MDOs to inform, *inter alia*, their treatment needs. The research was interested in exploring the process of this relationship and its meaning for participants, commensurate with the increased attention forensic mental health services are giving to patients' views (Coffey, 2006). Such an inductive methodology would allow for the development of concepts and theories from the resultant data, and complement the deductive approach of Chapter 4's quantitative study. Viewing each participant as unique validates the importance of tailoring substance misuse interventions for this special population, and will contribute to including patients' voices into the evidence base for 'what works', which has been largely established from the clinical perspective of care providers (Tapp, Warren, Fife-Schaw, Perkins, & Moore, 2013).

As presented in the previous chapter, the quantitative study found all participants had experienced at least two lifetime traumatic events with an average of seven plus high rates of problematic past substance use. For men, greater past substance use severity was associated with current levels of trauma-related stress but for women there was no relationship found. This suggests the underlying mechanisms between substance misuse and trauma may differ between male and female high-risk MDOs, and that a more detailed, gender-specific examination of trauma-related substance misuse treatment needs for MDOs is warranted.

A qualitative study is needed to explore women's perceptions of their drug use in order to tailor substance misuse treatment programmes to the needs of this vulnerable group of women. This was deemed especially important given the paucity of relevant research in the area. Although there have been some qualitative studies looking at patients' opinions on the relationship between trauma and their substance misuse, these have largely been undertaken with community samples (e.g. Finfgeld-Connett & Johnson, 2011; Gielen, Krumeich, Tekelenburg, Nederkoorn, & Havermans, 2016). This is the first study to investigate the nature and quality of the relationship between trauma and substance use in a high-risk female MDO population. It was hoped that a focussed discussion with the women to gain their perceptions of the relationship under investigation could facilitate a better understanding, and begin to unravel some of the characteristic complexities vis-à-vis their male counterparts, particularly the differences revealed in the quantitative investigation.

As noted earlier, the majority of substance misuse-related studies have been with men just as most research in offender populations focusses on men (Covington, 2008). Excluding certain subgroups from research generates knowledge that just benefits part of the population. Since the number of women imprisoned has doubled in the last 25-years, it is becoming increasingly crucial to ensure public health issues, such as substance misuse, related to gender are addressed (Prison Reform Trust, 2019). Moreover, qualitative research evidences much can be learned by heeding patients' narratives (Larrabee & Bolden, 2001; Sofaer & Firminger, 2005). This approach underpinned the qualitative study, which delved thoroughly into female participants' experiences and their views about the relationship between historic trauma and past substance misuse using thematic analysis; thus, imparting insight into means to improve recovery outcomes for this cohort of women.

Research Questions

The overarching research question for the qualitative component is:

What is the perceived relationship between past substance use and past trauma in female MDOs, and how might that influence their current treatment needs?

This directs the study to explore to two specific issues:

Question 1: What is the nature and quality of the experiences of trauma for female MDOs?

Question 2: How do female MDOs perceive the relationship(s) between their trauma-exposure, and substance misuse, mental health, and offending histories across the lifespan?

Aims

The primary aim of the qualitative study was to investigate high-risk female MDOs' views about the relationship between their past trauma, and substance misuse.

Method

The investigation comprised focussing on a subset of female participants from the quantitative study (target $n=20$). In-depth, face-to-face semi-structured interviews were conducted to explore further the relationship between trauma and substance

misuse to inform the treatment needs of high-risk female MDOs. Questions pertained to participants' perceptions about the relationship between trauma, mental health, and past substance use, along with their views on treatment needs, and the strengths and limitations of extant interventions experienced. In order to facilitate synthesis with the quantitative study's findings, only interviewees' perspectives on the connection between historic trauma and past substance misuse are reported.

Participants

The same criteria to partake in the quantitative research applied identically to the qualitative component i.e. between 18- and 65-years-old, detained under the MHA (1983/2007) within one high secure hospital, and able to provide informed consent. Four additional criteria were participation in the quantitative study, female gender, history of substance use, and history of trauma. It should also be noted the qualitative study operated under the same ethics procedures described in Chapter 4.

Materials

Patient Information:

Demographic data for participants of the qualitative study were collected via electronic records, which included their age, length of admission, marital status, religion, ethnicity, education, MHA (1983/2007) status, psychiatric diagnoses, and index offence(s).

Interview Schedule:

A bespoke semi-structured interview schedule was designed, and administered individually to female participants involved in the quantitative study to gauge their perceptions on the relationship between trauma, mental health, substance use, and offending histories in relation to treatment needs; their views were also sought regarding substance misuse treatment, particularly therapy to be facilitated within the high secure context. The interview was guided by a schedule of open-ended questions such as "How did this trauma affect you at the time?", "How does that traumatic event affect you now?", and "What do you think would be helpful to include in a substance misuse treatment programme?" (Appendix 10). The interview schedule was designed to encourage participants to communicate how they believed trauma affected their lives and in what way substances played a part, if at all. The audio recordings from the interviews were transcribed verbatim, and anonymised. During the latter part of interviewing one participant, a tape malfunction occurred. This was discovered immediately after interview; hence handwritten notes were made straightaway to fully capture the data. This participant is therefore included in the analysis.

Although interviewing 12 patients is deemed sufficient to reach data saturation (Guest, Bunce, & Johnson, 2006), in excess of this (i.e. 23 patients) were interviewed to assure rigour and trustworthiness, and maximum variation within this much selected population. In assessing sample size adequacy, it was important to exceed Guest et al.'s (2006) guide, which refers to code saturation (whereby codes are simply *identified*) and extend it to meaning saturation (where codes are fully *understood*), requiring more data (between 16 and 24 interviews) (Hennink, Kaiser, & Marconi, 2017). It was therefore prudent to go past the (code) saturation point of 12 to eliminate the possibility that new key concepts did not transpire in the ensuing interviews. Given the relative homogeneity of the interviewees and content of the

interviews, 23 participants surpassed this benchmark. Moreover, in qualitative research, circa 20 participants are considered to be of benefit for the researcher to develop and maintain a close relationship thereby enhancing the open and frank exchange of information (Crouch & McKenzie, 2006). This mitigates risks related to bias and validity issues that are inherent in qualitative research. Accordingly, the study's participant numbers heeded this optimal sample size (Crouch & McKenzie, 2006).

Procedure

One-to-one interviews were carried out on participants' respective wards in the allocated meeting room. For one interview, escorting staff were present due to risk issues. The interviews' duration ranged between 15-minutes to 2-hours with the typical interview lasting around 60-minutes.

At the start of the interview, each patient received identical guidance as per the interview schedule (Appendix 10), and was advised that the interview would be audio-recorded with a handheld voice recorder with the intention of accurate analysis of speech content (Morris & Moore, 2009). All participants were informed there were no right or wrong answers, that responses should be based on their experiences, and they were free to stop the interview at any time. One participant became upset and requested a short break, afterwards advising she was happy to proceed. No other participants became distressed. At the conclusion of the interviews, patients were thanked for their participation. An anonymised summary of the findings was offered to participants after the study's completion.

Analysis

The qualitative data yielded from the semi-structured interviews with the subsample of female participants were analysed using thematic analysis (Braun & Clarke, 2006). This is a flexible, widely-used, and valuable analytical method in applied psychology including forensic practice (e.g. Tapp et al., 2013). Thematic analysis enabled the identification of themes both deductively, centred on previous theory and research, and inductively by generating new insights directly from the data. Further, it provided a comprehensible means to highlight similarities and differences within the dataset. The six phases of thematic analysis as per Braun and Clarke (2006) were used to identify, analyse, and determine themes arising from the responses, consequently leading to the development of theoretical constructs. Although both latent content as theme and manifest content as category were considered (Vaismoradi, Jones, Turunen, & Snelgrove, 2016), most themes were identified via manifest content.

Quality Assessment

Quality assessment standards were followed to ensure the study's merit (Coffey, 2006); namely, COREQ (Consolidated criteria for reporting qualitative research; Tong, Sainsbury, & Craig, 2007) guidelines were heeded to ensure comprehensive and explicit reporting (refer to Appendix 11 for the completed COREQ checklist). To illustrate, data collection methodology has been described to assure transparency and credibility. To substantiate verifiability and trustworthiness of themes, these were checked by a second researcher. No themes were amended. Additionally, interview extracts are presented. Lack of transfer of findings was considered though the possibility of gaps in patient perspectives is likely minimal given the relatively large sample size. A reflective statement is offered (see below) to consider possible researcher influence (reflexivity).

Subsequently, the data derived from the discrete quantitative and qualitative data analyses were integrated via a process of triangulation to gain a fuller, more accurate interpretation of the study's results to create an analysis of greater depth and richness, improving the validity of the results (Agius, 2013; Creswell, 2014; O'Cathain et al., 2010).

Reflexive Statement:

As the researcher (EF) was known to participants, it was especially important the qualitative study was conducted reflexively to increase the transparency of the research methodology and to acknowledge possible sources of bias in interpretation of the data. The investigator reflected throughout how her role as whole-person-researcher (e.g. personal background, culture, and experiences) could potentially affect the research, not only possibly advancing biases and values, but how the researcher's background could shape the study's direction (Attia & Edge, 2017; Creswell, 2014).

The researcher is a HCPC-registered practitioner with training and experience in interviewing skills, and working with complex MDOs in different secure settings. The researcher had no specific personal connection to the topic under investigation, although had professionally led on substance misuse therapies in secure care and conducted past research in the area; hence the vulnerabilities of the persons being interviewed were well-recognised. Additionally, the researcher was confident and comfortable in recognising and managing emotional responses, and skilled in active listening, enabling disclosure.

Given many participants had faced negative experiences of men, the female gender of the investigator might arguably increase the participants' sense of security to disclose their feelings. However, the researcher was mindful that gender congruence does not

necessarily facilitate interpretation of another women's voice, particularly where there is vast cultural social divide, as in this case (Riessman, 1987).

It was appreciated the potential for the interview to be an extraordinary experience for some women in terms of discovering her thoughts, learning who she is, and 'finding her voice', especially in this cohort who historically have been oppressed. Correspondingly, the investigator appreciated participants, who previously had never had opportunity to express themselves, may not know what to do when given the opportunity (Reinharz & Chase, 2001). A compassionate approach was importantly taken.

When the research was devised, the researcher was a member of staff at the study site. This was beneficial as it facilitated an understanding of the policies and procedures within the unique context of the study's high secure setting. However, the investigator needed to exercise due caution with regards to the dual role of doctoral researcher, and Advanced Practitioner, especially once the research commenced. It was anticipated the researcher's existing clinical position at the study location was helpful vis-à-vis an unfamiliar, external investigator; the notion that participants would be predisposed to share their experiences given the researcher's status as staff, hence given more trust, was recognised. This was especially important in view of the sensitive topic under examination. It is worthy, however, to acknowledge some participants could have preferred to share their experiences with a researcher independent to the study site, perceiving 'outsiders' unable to impact upon their care. Regardless, it was essential to underscore with participants the difference between treatment and research whilst stressing when the boundaries of each may overlap e.g. if confidentiality was breached due to a security risk-related disclosure.

Reflexivity comprises two interacting elements (Attia & Edge, 2017). The preceding paragraphs reflect the first component; that is, *prospective* reflexivity pertaining to the

effect of the whole-person-researcher on the study. The second element of reflexivity also requires noting; *retrospective* reflexivity involves the effect of the research on the researcher (Attia & Edge, 2017). Although the participants shared their narratives in varying detail, the sensitive topic under investigation undoubtedly and predictably involved harrowing situations and experiences and at times, graphic accounts. The researcher, albeit experienced in forensic practice, was mindful of the impact the material could nonetheless potentially have on self. Discussion with professional peers along with access to regular clinical and research supervision provided a supportive space, if needed.

Results

Sample

All 27 female participants from the quantitative study had experienced past trauma and used substances and were thus eligible for participation in the qualitative research. Twenty-three participants were approached during the study period using consecutive sampling. All consented to be interviewed.

The qualitative study's results are shown below. To avoid inadvertently identifying participants in this distinct population, and to preserve anonymity, only the general characteristics of the sample are described with data aggregated and not linked to specific participant numbers.

Table 20 presents the sample's demographic characteristics. The sample's age ranged from 22- to 51-years-old ($M=35.61$), with their length of admission varying from 6-months to 23.66-years. The mean admission period was 5.16-years.

Table 20
Participant characteristics

	Participants (<i>n</i> =23)
Age Mean (<i>SD</i>) Median (Range)	35.61 (7.43) 36.00 (22-51)
Length of admission in months Mean (<i>SD</i>) Median (Range)	61.87 (64.59) 39.00 (6-284)
Marital status (%) Single Married Divorced/separated/widowed	18 (78.26) 1 (4.35) 4 (17.39)
Religion (%) Any Christian Other Not recorded	12 (52.17) 6 (26.09) 5 (21.74)
Ethnicity (%) White British Dual Heritage (White and Black Caribbean)	21 (91.30) 2 (8.70)
Education qualifications (%) None GCSEs/O levels Further education	17 (73.91) 4 (17.39) 2 (8.70)
Mental Health Act Section (%) (collapsed) Hospital orders Prison transfers	18 (78.26) 5 (21.74)

As shown above, most participants were single ($n=18$; 78.26%), White British ($n=21$; 91.30%), without formal qualifications ($n=17$; 73.91%), and detained under a hospital order ($n=18$; 78.26%). Over half the sample were of Christian faith ($n=12$; 52.17%).

Trauma Prevalence:

Table 21 represents the results regarding lifetime exposure to trauma. All women reported at least 2 past traumas on the LEC-5 with an average of 8 traumatic events (range 2 to 14).

Table 21
Outcome variables for participants for trauma exposure (LEC-5)

	Participants (<i>n</i> =23)
LEC-5	
Mean (<i>SD</i>)	7.78 (2.47)
Median (Range)	8.00 (2-14)

Substance Use:

As detailed in Table 22 below, the qualitative study's participants all reported problematic substance use in the past (*n*=23; 100.00%) with three-quarters experiencing problems deemed to be serious or severely problematic (*n*=17; 73.91%).

Table 22
Outcome variables for participants for past substance use

	Participants (<i>n</i> =23)
DAST-20 (drugs) severity total (%)	
1-5 (low)	4 (17.39)
6-10 (intermediate)	13 (56.52)
11-15 (substantial)	4 (17.39)
16-20 (severe)	2 (8.70)
AUDIT (alcohol) risk level total (%)	
0-7 (low risk)	1 (4.35)
8-15 (hazardous)	4 (17.39)
16-19 (harmful)	2 (8.70)
≥20 (almost certainly dependent)	16 (69.57)
Substance Use Severity Scale total (drugs and/or alcohol) (%)	
Non-problematic 0	0 (0.00)
Mild 1	3 (13.04)
Moderate 2	3 (13.04)
Serious 3	14 (60.87)
Severely problematic 4	3 (13.04)

As tabled above, for drug use, a high proportion of women had DAST-20 scores indicating past dependency, ranging from intermediate to severe levels (*n*=19; 82.61%). For alcohol, nearly every participant had past AUDIT scores suggesting risky

usage (i.e. ≥ 8) ($n=22$; 95.65%) whilst over two-thirds had reported AUDIT scores indicating dependency ($n=16$; 69.57%).

Psychological Sequelae of Trauma:

Typically, participants had an average of 4 ($SD=3.35$) areas of current trauma-related symptoms (range 0 to 11), which attained clinically elevated levels (i.e. $T \geq 65$) as per the TSI-2.

Regarding the TSI-2 factor T -scores and the clinical scale and subscale T -scores related to anxiety and depression, Posttraumatic Stress generated the greatest T -score ($M[SD]=61.91[9.89]$) with participants currently experiencing this at levels deemed to be problematic (i.e. $T \geq 60$). Neither the three other factor scores nor the clinical scale or clinical subscale T -scores met this cut-off.

Clinically elevated levels of current Posttraumatic Stress affected over one-third of the women ($n=9$; 39.13%), which was comparable to Externalisation levels ($n=9$; 39.13%). Furthermore, almost one-third experienced clinically elevated levels of Depression ($n=8$; 34.78%).

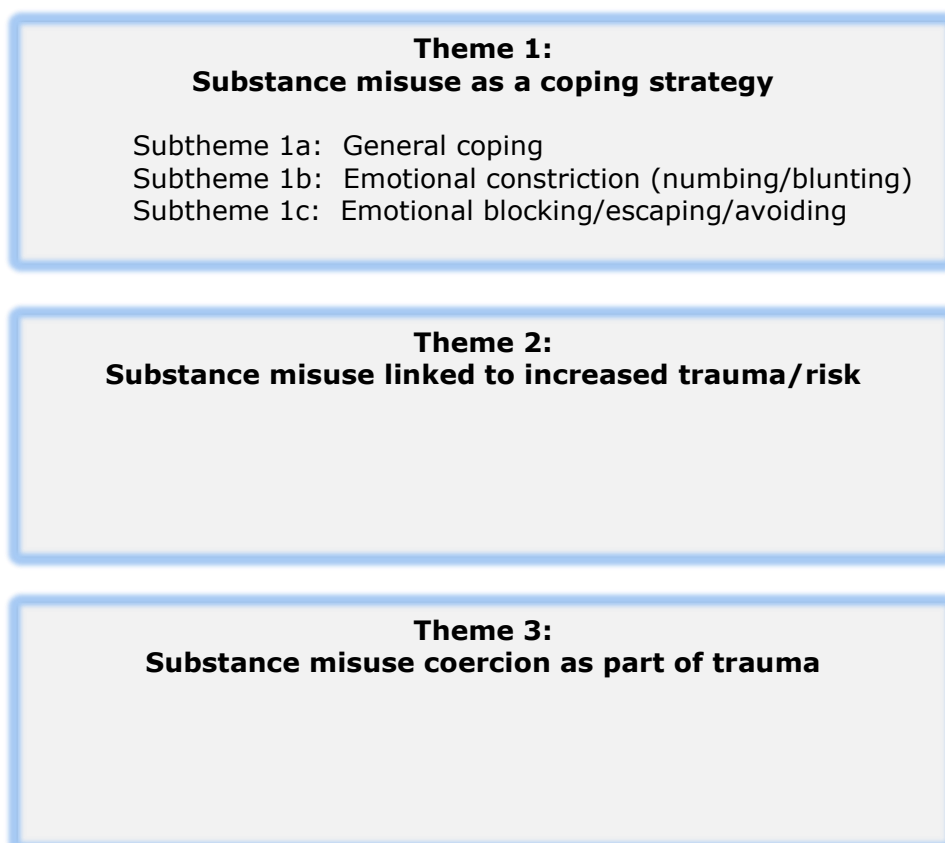
Themes

From the dataset, three superordinate themes were identified with one theme having three associated subthemes. These are depicted in Figure 5. Following, the three themes and subthemes are described individually although they are not mutually exclusive; each is connected. Participants consistently reported their substance misuse functioning across more than one theme. For example, persons experiencing avoidance

behaviours may also have symptoms of emotional numbing such as loss of interest in enjoyed activities, feeling distant and isolated from others, and difficulties experiencing positive emotions. The relationships between themes indicate the specific nature of the research question, and intricacies of the consequential data.

The below-noted excerpts have been selected with care from the dataset to illustrate the themes, and are considered to be a representative sample of each theme. All quotations are identified with the participant's number (e.g. Part33, Part34, etc.). Pseudonyms were intentionally not used as are generally disfavoured because they could lead to wrong identifications or assumptions amongst readers (Corden & Sainsbury, 2006). Any superfluous or irrelevant material is denoted with ellipses; non-fluent speech, along with utterances from the researcher to maintain interaction (e.g. 'yeah') have likewise been omitted to enhance readability without changing meaning.

Figure 5
Themes and subthemes from interview data exploring participants' views on the relationship between trauma and substance misuse



Theme 1 – Substance misuse as a coping strategy (n=23; 100%):

The crux of this theme captures the self-medication hypothesis in that misusing substances provided participants a means of tolerating trauma-related distress and negative affect. This was a very strong theme with all participants (n=23) describing how past substance misuse was a reactive coping response, following exposure to the trauma stressor. Three subthemes emerged from this master theme: (1) Drugs and alcohol were a broad-spectrum means to cope with the aftermath of a traumatic experience, (2) substances may have offered participants in the face of trauma, a 'freeze' response by numbing their emotions, and (3) substances allowed the women to take 'flight' i.e. to avoid or escape reality and/or emotional pain related to the trauma.

Subtheme 1a: General coping (n=16; 69.57%)

Participants spoke generally about the connection between their misuse of substances as a means to cope resulting from trauma exposure. This was a particularly strong theme with over two-thirds of the women noting it.

...it [the sexual abuse] went on for quite a while and that's when I started drinking and that's where it led to the point where I was abusing drink all the time after that.

(Part44, p.137)

Commonly, participants described high levels of systematic consumption.

...I become a real bad alcoholic and I was drinking three litre bottles of Bacardi or...vodka a day, plus going to the pub in the evening...Plus I was smoking cannabis and I was smoking about 60 to 80 cigarettes a day [to cope with abuse]. (Part47, p.174)

Many specified using substances to self-medicate the aftereffects of trauma.

I hated myself, I had little self-respect, I was getting into trouble, into fights, drinking, taking drugs, sniffing aerosol cans, just to help me, just to help me get through the day. I remember once when I was discharged from hospital at 17, I went to the chemist, purposely bought 10 to 15 deodorant sprays, went back, went up to my room in hospital and started sniffing all these aerosol cans and it was making me go on a high. My head was racing, my head felt good and everything...it felt as though I was drunk and I was all over the place...but it just helped ease the pain. (Part55, p.268)

Subtheme 1b: Emotional constriction (numbing/blunting) (n=7; 30.43%)

When confronted with dangerous and sometimes life-threatening circumstances, participants found substances facilitated them going into a 'numbing mode' as integral to the 'freeze' response to survive incredibly challenging events, reduce hyperarousal symptoms, and ease intolerable emotional pain. Disconnecting through substance misuse was, paradoxically, related to self-preservation; it was a means to maintain sanity and/or save their life. Although this theme was less commonly endorsed by the women, verbally rich descriptions were provided.

...it [substance misuse] seems like an easy thing, just, if ever like, I still think about it now sometimes...If ever I'm upset, I'll just think I wish I could just take something to like, take my mind off it or take the pain away, and that's just a quick thing, like to forget a bit, even if just for a second. (Part37, p.45)

...when I did get into trouble owing to unwanted circumstances, we just sort of ran off and get away from it all. The adrenaline rush would be going and you'd sit down and

you'd have your drink or you might have microdot, which is LSD... and it would just trip you out and you'd just sit there laughing...(Part39, p.57)

Substance misuse as a protective response highlights the reflexive, instinctive withdrawal from actual or perceived distressing stimuli that can endure for significantly longer after the actual risk or threat has gone, which the person may not be conscious of. At first, emotional disconnection afforded by substances can provide a feeling of pseudo-equanimity, a state of psychological stability and composure. Substances serve to provide a protective shield (Freud, 1920) to the trauma victim, which can lead to a dissociated or depersonalised state.

I was doing other things like overdoses and stuff...Paracetamol, like prescription medication I was on...It kind of numbed everything [dealing with traumas]...It just numbed everything...(Part51, p.214-215)

Subtheme 1c: Emotional blocking/escaping/avoiding (n=15; 65.22%)

This subtheme represents the avoidance cluster of PTSD-related symptomatology, emphasising the 'flight' aspect. This comprises trying to avoid the symptoms of hyperarousal and thoughts, feelings, upsetting memories, or external reminders of the traumatic event. Participants explained that they used substances to help them escape and/or prevent uncomfortable emotions from arising, for example, sadness, distress, or shame. This theme was especially strong, cited within nearly two-thirds of the women's narratives.

And then [after sexual abuse by father] obviously I was using alcohol and things to try and block things out and try and make things a little bit easier for me to cope and things like that. (Part46, p.160)

It [substance misuse] just stopped everything [traumatic memories] from going on in my head...It stopped it all from going on. (Part51, p.215)

Persons also regularly engaged in substance misuse in an attempt to withhold emotional expression.

...[Substances] just pushed it [trauma] all away, every single piece of it, everything, all the shit from when I was younger...and when I was like drunk or high, none of that mattered and yeah like I used to get off my face on Class A and all sorts...(Part56, p.287)

Some women highlighted the clear link between substances helping to not only block out emotions arising due to negative emotional repercussions of the trauma but helping them to survive the traumatic act whilst it was carried out. In this regard, substances were proactively taken to enable them to tolerate the abuse.

...my drug use was based on trauma. My alcohol, the excess, I didn't drink like regularly, but I binge drank, so when I did drink, I drank heavily...and it was massively during the trauma as well, as a block out to it all...I see it as, if there wasn't the trauma there in the first place then I wouldn't have had anything that I needed to avoid...I wouldn't have had something that I needed to block out. I wouldn't have been looking for that thing. I wouldn't have needed that extra fix. (Part41, p.92)

I started taking drugs to block out what was happening [sexual abuse by father]...When I knew things were gonna happen because I worked in this pub, I took...I nicked a bottle of vodka and drank it so that I wouldn't know what was going on and what he was doing to me. It just went from there really. (Part57, p.299)

Participants expressed appreciation for the function substances held in enabling them to tolerate trauma-related, risky situations.

...I was grateful for them [drugs], because it blocked things out...so when I got taken places and...I had to go because if I didn't, even if I knew I was at risk...and so I actually looked forward to taking drugs because it blotted all that out, it blotted all the dangers of it, the fear and anxieties of it out...(Part39, p.57)

Theme 2 – Substance misuse linked to increased trauma/risk (n=8; 34.78%):

At the core of this theme is the high-risk hypothesis, which suggests using substances and associated high-risk activities increases the risk of trauma exposure, thus indirectly increasing the likelihood of trauma (Hien, 2014). This is akin to a 'fight' reaction. More than one-third of participants reflected this theme with rich descriptions. Some spoke about how alcohol intoxication gave them strength and confidence for wilful, continued involvement in or exposure to a lifestyle with a high degree of danger.

...when in later life when I experienced even worse trauma, I just, I turned to drugs myself and I turned to drink and I didn't care about anything. I was on self-destruct and I didn't care about anybody. I'd fight with anybody, get the authorities out just to fight with them 'cos I hated everybody...drink and drugs gave me Dutch courage to go out and fight and that's all, that's all I wanted 'cos of me hatred towards everybody, so that's why I'd drink and take drugs even more to give me the power that I needed to go out and be a shit really. (Part39, p.65)

...well I've always binge dranked, always binged, like you know, I won't drink for weeks and weeks and then I'll get a bottle of...Bacardi and Coke and just, my intentions is to

drink it all in one like, night and get absolutely blotted, completely drunk, out my head, and partly, partly why I do that is to...to kill off my inhibitions and do whatever I feel like doing, so if I feel like I'm going to go crazy. I've got that like little thing in my head saying, "You can do it now, go ahead, do what you want, do your worst"; you know, that kind of thing and sadly it got me into trouble...(Part42, p.112)

Other participants emphasised the association between substance misuse and high-risk sexual behaviour. For one participant, this resulted in being sexually assaulted with consequent unintended pregnancy, leading to further trauma.

And then the once, on a night I took drugs, which got me back into hospital again, I...went out with this patient, resident shall I say...She was a couple of years older than myself and she took me, I didn't know that she was involved in prostitution or nothing, she took me round to one of her punters' house; he forced sex from me, I became pregnant 'cos, this happened when I was 11, then I had to have a miscarriage, not a miscarriage, an abortion/termination. (Part55, p.266)

For others, high-risk sexual behaviour linked clearly to their substance misuse with sexual promiscuity utilised as a currency for 'payment' of drugs.

...while I was drinking, I ended up in lots of people's houses, taking lots of drugs, but not actually realising what I was taking. I'd end up like in drug dens and I'd wake up in the morning and I wouldn't really remember what had happened to me...people wanted me to do like certain sexual acts in order to get the drugs and I honestly can't remember much about it at all, but I know that I did things that other people wanted me to do as a way of like, getting drugs and not having to pay for them. (Part52, p.224/226)

Theme 3 – Substance misuse coercion as part of trauma (n=3; 13.04%):

This theme centres on the perpetrator(s) of the trauma further incapacitating their victim by supplying drugs and/or alcohol. This proffering was seemingly connected to weakening the victim's consent, and increasing her acquiescence, which is a more effective 'strategy' for the perpetrator than unremitting deprivation and fear (Herman, 2015).

...one of the traumas that I experienced a bit further down...I was actually made to take drugs and that was the first time I'd taken drugs, when I was made to take them...I was being forced to take it [substances] because of the trauma and then I became dependent upon it because I knew it helped me...(Part39, p.57/65)

Umm, I was using alcohol while it [sexual abuse by father] was happening...He used to ply me with booze anyway...(Part41, p.86)

And he [step-father who was sexually and physically abusive] used to give me alcohol. So he used to let me have a drink of his...He used to drink Special Brew. (Part42, p.106)

Despite the small number of responses for this theme, participants' accounts were expressly powerful. Using substances under duress intrinsic to the trauma may be construed as important for interventions, and feasibly more relevant for women.

Discussion

The detailed exploration into female participants' views concerning the relationship between their past trauma and substance misuse yielded three superordinate themes. The first theme relates to substance misuse as a coping strategy, encapsulating the self-medication hypothesis. Here, three subthemes emerged, illustrating more detailed aspects, which included misusing substances for general coping, emotional constriction, and emotional blocking purposes. The other two superordinate themes comprised substance misuse's link to increased trauma/risk exposure, supporting the high-risk hypothesis, and coercion to misuse substances as part of the trauma. Of note, manifested within the themes are the flight, fight, and freeze responses to trauma – widely-used terms for the typical indicators that safety is threatened, and feelings related to danger are overwhelming.

Theme 1 – Substance misuse as a coping strategy:

Based on the women's narratives, without exception all participants declared their substance misuse was a direct effort to self-manage trauma-related symptomatology, which fell into the three main categories of hyperarousal, intrusion, and constriction (Herman, 2015). Participants stated that substances assisted them to deal with the physical and psychological outcomes following trauma exposure, which generated distressing emotional states and consequent behaviour. As there was an apparent functional link between participants' substance misuse and trauma-related symptomatology, with trauma-related distress precipitating the drug use, this evidences the self-medication hypothesis. Research has provided the most support for this hypothesis (Dworkin, Wanklyn, Stasiewicz, & Coffey, 2018; Haller & Chassin, 2014); this is mirrored in this study's data given Theme 1 acquired the most responses. As

well, these findings are commensurate with the quantitative study's results, which found that level of past trauma was positively correlated with substance misuse.

Although some authors (e.g. Covington, 2008) argue that trauma-related behaviours can be categorised into retreat (e.g. isolation, dissociation, anxiety, depression), self-destructive action (e.g. substance misuse, self-harm), and destruction action (e.g. aggression, violence), the researcher considers substance misuse permeates each behavioural category and not just self-destructive action. As evidenced in participants' narratives, they often self-isolated whilst using substances to detach from the trauma, and to deal with anxiety and depression arising. Plus, violent behaviour and physical force accompanied substance misuse.

Evident in Theme 1 (Subtheme 1b) is the 'freeze' response. The trauma victim is rendered powerless, accepts any resistance as futile, and as a result, may go into a state of submission or surrender; this refers to the victim altering her state of consciousness (Herman, 2015). Appearing numb, there is no act of self-defence but paradoxically a state of detached calm, as if they have 'given up', similar to learned helplessness (Seligman, 1972). Self-medicating with substances can be viewed as a vehicle to achieve and maintain this state during the trauma but also afterwards.

As outlined in Chapter 1, research indicates alcohol use increases after traumatic stress due to the body secreting endorphins, which stimulates the body's opiate receptors, triggering an analgesic effect (endorphin compensation hypothesis) (Volpicelli et al., 1999). In the case of multiple trauma, opioid receptors are regularly activated, which results in anti-opioid-like effects; with time, this gets stronger, and the endorphin system lessens or habituates (Volpicelli et al., 1999). As drinking, and by extension other CNS depressant substances such as opioids, increases endorphin action, substances can compensate for the endorphin withdrawal following a traumatic

experience (Fareed et al., 2013). Distinct to this perspective is that the trauma sufferer is seen to define the traumatic event as cognitive (uncontrollable) vis-à-vis affective (overwhelming). It is likely both components are present; however, cognitions are secondary to emotions.

Additionally, the trauma response related to 'flight' is highlighted within Theme 1 (Subtheme 1c). Here, participants' response to trauma is towards fleeing danger. It relates to *preventing* emotion, which distinguishes it from Subtheme 1b which is about *reducing* emotion. Adrenaline plays a central role in the body's flight response through increasing cardiac output, blood glucose levels, and blood flow to muscles. This can occur during the trauma, and subsequent to the event. In one sense, the adrenalised victim may become 'addicted' to this state and susceptible to sensation-seeking behaviour, which is correlated with increased risk of substance misuse (Fehrman et al., 2019), especially within the context of an existence offering little pleasure.

Theme 2 – Substance misuse linked to increased trauma/risk:

If it is impossible to escape during the 'flight' response to trauma, persons may resort to 'fight' mode. None of the participants reported attacking behaviours during trauma exposure. However, the self-medication theory highlighted in Theme 1 would suggest substance misuse following trauma exposure consequently leads to risky behaviours that may lead to more trauma and/or the commission of violent offences against others and self (high-risk hypothesis) (Clark, Reiland, Thorne, & Cropsey, 2014). Indeed, this was a theme that emerged via the accounts of over one-third of participants with substances providing a vehicle for the 'fight' response.

In this scenario, the women were seemingly active participants in that they knowingly placed themselves in high-risk situations. They depicted circumstances whereby

substances instilled feelings of invincibility, connected with violent and aggressive acts. This behaviour seemed to be a compensatory reaction given the women, within the context of habitually feeling helpless and powerless as a trauma victim, were able to establish a degree of control over physical and emotional responses that (re)affirmed a sense of power in the self (Herman, 2015). Undoubtedly, however, this increased their risk of trauma exposure.

It is well-documented in the research literature the link between past trauma exposure and substance misuse with violence and general impulsive externalising behaviours in offenders (Ardino, 2012; Pickard & Fazel, 2013). Externalising behaviours are defined as problematic, self-destructive, or aggressive behaviours as a means to manage overpowering internal states (frequently trauma-related) and/or significantly weakened ability for affect regulation, which, expectedly, would predispose a person to increased risk/trauma (Briere, 2011). It is unsurprising therefore this relationship was reflected generally in the results of the quantitative study's sample with the confirmation of Hypothesis 1 in that greater levels of past trauma were associated with a greater degree of past substance use in high-risk MDOs. Moreover, the quantitative research found for female participants only past drug use severity was associated with current TSI-2 Externalisation-related symptomatology, which complements Theme 2.

Although relevant studies are limited, some support comes from research by Clark et al. (2014) who interviewed 615 persons under criminal justice supervision, and enrolled in a substance misuse treatment programme. Using univariate and multivariate analyses, they found participants using substances and with a history of trauma exposure had the highest rates of externalisation behaviours including offences against persons.

Although only 15.70% of their sample ($n=89$) had endorsed both substance use and past trauma (with men and women equally likely to be in this group), their findings are nonetheless expectable given that substance use, and trauma have been discretely

correlated with externalising behaviours (Clark et al., 2014), and lends support to substance misuse increasing exposure to risk/trauma. However, given their sample was disproportionately male (69.40%) and gender was not included in the regression analyses, interpretations about differential pathways for the genders are precluded. Even though past research has shown trauma is more likely to be associated with substance misuse in women (e.g. Becker et al., 2012; Volpicelli et al., 1999), this was not corroborated in the quantitative study. This suggests that high-risk MDOs are a distinct group with specific gender-related needs, and demand a tailored intervention.

Theme 3 – Substance misuse coercion as part of trauma:

Three participants specifically cited they were forced to take substances, and this was intrinsic to the trauma. The research literature broadly refers to this as drug-facilitated sexual assault as the abuse occurs after drug ingestion that renders victims incapacitated, often referenced as 'date rape' or 'drug rape' (Butler & Welch, 2009). However, with respect to the qualitative study, this meaning is a misnomer, as it only approximates the participants' experiences since two women specifically stated the abuser was their father, and that the abuse was systematic, and not a discrete occurrence as implied by 'date'. Indeed, the usual stereotype of drug-facilitated sexual assault is of a predator male secreting a drug, usually flunitrazepam (i.e. Rohypnol) into an unsuspecting woman's drink, and then taking her somewhere for sex after the drug takes effect (Horvath & Brown, 2007).

Another distinction drawn from the women's narratives concerns their consent to using substances. Although the overall aim of the role of substances is based on the perpetrator's *intent* to disable the woman through induced incapacity, the participants' *consent* seemed to cover both 'opportunistic' drug-facilitated sexual assault (drugs are voluntarily consumed, and the victim is taken advantage of) and 'proactive' drug-

facilitated sexual assault (the aggressor intentionally administers substances to the victim) (Butler & Welch, 2009). As noted in Participant 39's account, she was initially coerced into using substances, and then started to welcome, and enjoy, them:

... I was being forced to take it [substances] because of the trauma and then I became dependent upon it because I knew it helped me and that's when I kind of just loved it...(Part39, p.65)

Participant 39, in trying to make sense of her drug use, infers drugs were enjoyed, ostensibly a rationale. This highlights that similar to other studies, participants self-intoxicated voluntarily, and infrequently experienced surreptitious drugging (DuMont et al., 2009; Horvath & Brown, 2007). Further, alcohol was indicated as the drug of choice by two participants, which supports previous research suggesting alcohol is a greater, under-reported substance in drug-facilitated sexual assaults, and that has, moreover, uncovered that other varied substances are consumed like cannabis, cocaine, volatile substances, ketamine, and prescription drugs including benzodiazepines (DuMont et al., 2009; Horvath & Brown, 2007).

The stereotyped portrayal attached to the terms drug-assisted sexual assault/rape is challenged because, like other researchers, this study has found that the terminology is incongruent with the women's actual experiences regarding drug type ingested, and who caused the incapacitated state. Moreover, given the narratives of participants, the term is too restrictive as the traumas experienced by the women extend beyond sexual abuse and they were driven to drug-taking by their abusers. Drug-facilitated sexual assault is thus better viewed more broadly, and referred to as drug-facilitated trauma for this specific cohort of women.

Betrayal Trauma:

Participants' narratives throughout the three themes highlighted that, in general, a large portion experienced incidents of betrayal trauma; that is, trauma committed by someone with whom the victim is close to, and dependent on for support and survival (Freyd, 1996; Goldsmith, Freyd, & DePrince, 2012). Research highlights that persons subjected to betrayal trauma experience more complex, negative psychosocial outcomes including a key factor of BPD, which was nearly ubiquitous in the sample (Delker & Freyd, 2014; Kaehler & Freyd, 2012).

For the study's cohort, betrayal trauma primarily referred to incestuous abuse by parents or carers. A concerning sequelae to sexual abuse, with childhood sexual abuse the best predictor, is the high risk of being re-victimised; multiple traumas are also associated with higher risks (Classen, Palesh, & Aggarwal, 2005). This corresponds well to Theme 2's finding that substance misuse seemed to increase the likelihood of trauma exposure.

Research indicates re-victimisation correlates include substance misuse, as well as higher distress, psychiatric disorders, and demonstrable difficulties with interpersonal relationships, coping, and affect regulation (Classen et al., 2005). Regarding intimate relationships, these are led by needing security and care whilst being pre-occupied with exploitation or abandonment; predictably, protecting herself within intimate relationships is difficult due to failure to recognise or heed warnings with repeated victimisation likely and correlated with continued substance misuse (Hien et al., 2009). Furthermore, drug problems may be perpetuated through recurring relationships with persons addicted to substances – an issue which was borne from the transcripts. The women described low self-esteem with a general acceptance of improper behaviour, often part of the 'freeze' response, which could increase further trauma recurrences.

Trauma Bonding:

The notion of 'trauma bonding' as a result of interpersonal trauma has emerged in recent years, and materialised from the participants' data as a specific feature, permeating all three themes. Stockholm syndrome is the most propagated term associated with trauma bonding; however, Stockholm syndrome refers generally to the trauma bond created between captors and captives within the context of kidnap or hostage-taking circumstances whereas trauma bonding is applied to describe the phenomena of bidirectional attachments developing between abusers and victims, which may occur in a range of exploitative relationships (Reid, Haskell, Dillahun-Aspillaga, & Thor, 2013). From the participants' narratives, the abusers were cited as partners, and fathers.

Criminal acts involving interpersonal violence such as intimate partner violence and childhood sexual abuse, share four precursor factors that have potential to result in a trauma bond; these include perceived threat to one's physical and psychological survival through the agency of an abuser, perceived kindness from the abuser to the victim, isolation, and inability to escape (Reid et al., 2013). A trauma bonding/attachment model can help to explain why trauma victims, paradoxically, can have great difficulty detaching from the abuser, and disclosing the abuse.

The emotional bond, which has enabled the abuse, also functions to protect the offender even after the abuse has ceased given its impact on the sufferers' ability to disclose and criminally report their abusers (Jülich, 2015). This relates to participants' experiences given their descriptions of domestic violence perpetrated by partners, and childhood abuse committed by their fathers and step-fathers. Substances, in these instances, featured in Theme 1 with the women utilising drugs for emotional blocking

purposes, and in Theme 3 where participants described being compelled to take substances in the course of the trauma.

Research suggests insecure attachment may be a vulnerability factor for substance use. For example, a recent meta-analysis found that insecurely attached individuals engage in more substance use than securely attached individuals, the association between attachment and substance use endures over time, and insecure attachments precede later increases in substance use (Fairbairn et al., 2018). This accords with research demonstrating that problematic substance use occurs more frequently in individuals with a history of childhood trauma, especially when the parent-child attachment is disrupted, and low emotional regulation abilities (Briere, 2019; Kelly & Bardo, 2016; Schindler & Bröning, 2015).

Neuroscience provides an explanation of substance misuse based on the brain's reward systems. Drug rewards may trigger the same brain systems as intense natural rewards with the application of addiction theories based on pleasurable drug hedonia or positive reinforcement with dopamine and norepinephrine important in this process (Kelley & Berridge, 2002). Seen through this lens, the trauma bond, notably in recurring exploitative relationships and victimisation, and addiction might share underlying features. The abusive relationship involves punishment with intermittent reinforcement of kindness; hence the body is conflicted with high levels of cortisol being produced from the high stress levels, whilst dopamine is created when exposed to a rewarding stimulus (love and affection). The body becomes dependent on this vacillation; therefore this process may provide an explanatory model.

Nevertheless, neuroscience's 'reward' and 'pleasure' pathways, although providing a reasonable explanation for drug effects with short-term or intermittent use, seems to unsuccessfully explain the complexities of what makes substance misuse behaviour and

relapse so powerful and determined (Khantzian, 2012). This is particularly poignant given that addiction is relatively uncommon. Returning to the self-medication hypothesis, derived from self-regulation and attachment theories, vulnerability to substance misuse develops from drug exposure, combined with the inability to tolerate or understand one's feelings; hence substance misuse is not regarding seeking pleasure but as a substitution for comfort and contact (Fletcher, Nutton, & Brend, 2015; Khantzian, 2015). As represented in Theme 1, substances mitigated trauma-related distress and helped to counterbalance an unstable sense of self. Since these persons are powerless to recognise and regulate their feelings, they appear like they do not need close interpersonal relationships (Khantzian, 2012). The self-detachment and distancing from others create immense distress, generating more dependence on substances (Khantzian, 2011).

However, a noteworthy finding is that although substance misuse for self-medication purposes emerged as a strong theme in the qualitative study for women, the quantitative examination's results indicated this relationship between past substance use and current trauma-related stress, which is predicted by self-medication theory, held for men only. As reported previously, there were no differences found for male and female participants in the quantitative component with regards to past levels of problematic substance use and trauma, and degree of current trauma-related stress. The women seemed to have a clear understanding of the relationship between substance misuse and trauma, accepting their vulnerability and their attempts to manage the trauma with substances. It is feasible that although the women described blunting and avoidance, they were able to describe the process, accordingly allowing them to process the trauma. This could provide rationale why the extent of past substance use was not associated with current trauma-related distress for them. Furthermore, since the women may have been exposed to substances as a result of or

in conjunction with the trauma, the amount of past substance use does not directly reflect their level of trauma-related response.

Strengths and Limitations:

The sensitive nature of the qualitative study's content – past trauma, substance misuse, and other illegal activities – may have precluded or limited participants' disclosures. However, as noted earlier, the dual role of researcher and clinician within a therapeutic environment facilitated establishing rapport, and trust. Although it is recognised that perfect interviewer-interpreter-interviewee congruity is neither possible nor desirable, a sensitive collaboration occurred during both interview and analysis, enriching the study (Riessman, 1987). As a result, a strength of the qualitative study was that participants were generally enthusiastic about partaking, and were candid and informative sharing their experiences. This presents the concept of 'the gift' relationship as a framework for understanding the dependence of researchers on what participants are willing to contribute from the memories and narratives of their lives since the product of the research is 'our story of their story' (Oakley, 2016).

Given the women's participation level ($n=23$), another positive of the qualitative investigation was that it sampled across the range of experience for this very specific population. There seemed to be a high degree of interest based on the study's rationale of informing the development of a therapy programme, furthered by the therapeutic relationship with the investigator. As the focus of the research was to investigate an underexplored area, taking a holistic perspective by using a qualitative approach with female participants generated a rich source of information, outweighing any limitations related to objectivity and generalisability.

Self-report is fundamental to qualitative research; many psychologists argue that researchers should always ask participants their views unless there are compelling reasons not to (Barker, Pistrang, & Elliott, 2005). As it was important to explore the meaning of substance use for individuals, self-report *ergo* provided access to phenomenological data unobtainable in other ways. Moreover, procedures were embedded in the process such as purposive sampling, reflexivity, and triangulation, which strengthened the scientific rigour of the qualitative component (Barbour, 2001).

The qualitative study is not without limitations, however. Participants were asked to make sense of experiences that occurred long-ago; hence memory recall issues may be germane. Additionally, nearly all participants had a diagnosis of BPD (borderline personality disorder), which may have affected their ability to reflect on their experiences given that perceptive distortions are a hallmark of BPD (Reising, Farrington, Ttofi, Piquero, & Coid, 2019). Therapy may too have impacted upon their interpretation.

Clinical Implications:

The qualitative study's results supporting the self-medication hypothesis (Theme 1) and emphasising the role of trauma, especially betrayal trauma, provides an explanatory model based on self-regulation why high-risk female MDOs have misused substances, which corroborates past research (Fletcher et al., 2015; Padykula & Conklin, 2009). Highlighting the role of inadequate emotional regulation, suggests if therapy can increase the patients' capacity to manage negative emotional states, the need for external avoidance strategies (such as substance misuse) could be decreased (Briere, 2019). It is important for the patient to engage with emotional regulation work prior to introducing trauma or attachment-related components to therapy given the likelihood of

triggering painful memories to improve their ability to cope, and to not overwhelm them.

Theme 2's data provides support for the high-risk hypothesis, which has previously been without empirical validation (Hien et al., 2009). This may signify the distinctive nature of the study's sample – an especially high-risk group that is liable to engage in multiple risk behaviours, any of which may increase their risk for exposure to violence (Haller & Chassin, 2014). Moreover, given that persons who have risky lifestyles are at a greater risk of becoming both offenders and victims of crime, this lifestyle-crime involvement link suggests persons who spend time with friends involved in crime inadvertently place themselves in situations where the risk of victimisation and offending is high (Rokven, deBoer, Tolsma, & Ruiter, 2017). A pragmatic approach thus may be targeting trauma-related and impulsive lifestyle criminogenic needs in psychoeducation components of substance misuse treatment.

Stockholm syndrome is seldom considered in the child sexual abuse literature despite its interrelationship with trauma bonding, and its ability to complicate the recovery process for victims, especially those subjected to childhood sexual abuse (Jülich, 2015). Given that the phenomenon was exemplified in the women's narratives, related training for professionals working with child sexual abuse survivors is further advocated.

Conclusion:

The qualitative study has expanded upon the results of the quantitative investigation by providing a more detailed exploration into the relationship between trauma and substance misuse for high-risk female MDOs. The views of 23 participants were sought via a bespoke semi-structured interview, with the data analysed using thematic analysis; this allowed for greatest variation within the cohort, maximising the study's

reliability. Emanating from the data, three superordinate themes emerged, unravelling pertinent issues. Theme 1 highlighted participants' substance misuse was connected to self-medication, either as a general coping means, or to provide emotional constriction, or emotional blocking following trauma exposure. Materialising from Theme 2 was the women's usage of drugs and alcohol led to increased exposure to trauma and dangerous situations whilst Theme 3 emphasised that for some women substance misuse involved a coercive component of the traumatic act.

This innovative study, the first exploring the relationship between trauma and substance misuse in high-risk female MDOs, makes some significant contributions to the literature. First, Theme 1's findings reinforces prior research about the well-supported self-medication hypothesis yet uncovers subtle nuances of this model distinguished via three subthemes whilst extending the theory to high-risk MDOs. Second, the study provides corroboration about the unsupported high-risk hypothesis as per Theme 2, and similarly broadens it to this specific female cohort. Third, the results represented by Theme 3 expands the evidence base on drug-facilitated sexual assault, regularly referred to as date rape or drug rape, and importantly, highlights the inappropriateness of applying this categorisation to high-risk women as it is an inaccurate representation of their experiences, proposing instead drug-facilitated trauma.

These results suggest important treatment targets for this population of women. Though the themes discovered are reported separately with the flight, fight, and freeze responses to trauma integral, they are not mutually exclusive; hence may be incorporated into a broader treatment model. Triangulation with the data generated from the quantitative study suggests that externalisation for high-risk female MDOs may be an important corollary of trauma exposure with substance misuse both an externalising behaviour and a risk factor leading to further externalisation. Attachment

theory is inherent here with substances affording support via a surrogate attachment bond. This indicates these are important treatment considerations for this specific cohort, with this study adding an important element into the 'what works' evidence base by canvassing women's views and incorporating their voices.

CHAPTER 6

CONCLUSIONS

Aims of the Thesis

The substance misuse literature has traditionally concentrated on men's needs whilst overlooking women's, although in recent years gender-specific programmes have received growing attention. As substance misuse is associated with trauma exposure, and trauma rates have been found to be higher for women, it has become apparent that focussing on trauma is essential for women's substance misuse interventions (Covington, 2008). Moreover, mental disorder is greater in females, including offenders (Light et al., 2013). Although research has demonstrated trauma, substance misuse, and mental disorder are highly prevalent in high-risk MDO populations, escalating their risk to remain entrenched in the criminal justice system, the provision of therapy is deficient and studies are scant (Ardino, 2012; Long et al., 2008). This is markedly salient for high-risk female MDOs given there is no research concerning the link between trauma and substance misuse with this cohort.

This thesis sought to address the literature's dearth by investigating the trauma-related psychological sequelae in high-risk MDOs and its relationship with substance use, and ascertain if there are gender differences in those associations to inform treatment interventions for this unique population with interconnected mental health problems. Furthermore, the systematic review contributes to knowledge by exploring gender differences in alcohol and drug-using offenders whilst the TSI-2 critique summarises the tool, and evaluates its psychometric properties.

Summary of Findings

Chapter 1 provided an introduction and summary of the research regarding gender-related differences in substance misuse, trauma, mental disorder, and for MDOs. It was observed that past trauma increases a person's vulnerability to substance misuse with comorbidity common along with higher rates of trauma in those with co-occurring mental disorder and substance misuse. This afforded a context for the thesis, and highlighted the limited extant evidence base with respect to MDOs, especially high-risk females notwithstanding the surge of contemporary studies exploring gender differences. Working definitions for key terminology were afforded, encompassing trauma, substance misuse, and mental disorder. An adapted self-medication theoretical model was developed from the literature, and illustrated pictorially to show how trauma exposure is a risk factor for the commencement and maintenance of substance misuse. Gender-specific predictions are not incorporated due to the small number of gender-based studies. The model underscores trauma-related symptoms influence drug use, and not the traumatic event independently.

Chapter 2 presented a systematic review investigating gender differences in illicit drug and alcohol-related offending with the intention of informing gender-specific treatment. It was necessary to employ a broad research question due to the limited research (as determined in Chapter 1) so that enough relevant research was obtained. Subsequent to employing well-defined PICO criteria, 19 publications were included for examination. The review included an overall sample of 136,855 convicted offenders – 112,890 males, and 23,965 females; the disproportionate amount of men reflects the relative size of the female prison population. The quality assessment showed none of the papers were appraised as being of high quality, with most considered of good quality. Due to the heterogeneity of the included studies, descriptive synthesis was used to present the data.

The findings from Chapter 2 revealed women and men appear to have different vulnerability factors; males were found to be older with more arrests, convictions, and higher rates of incarceration. Women had greater levels of social disadvantage with regards to education, employment, and income. Moreover, it was found women had suffered greater trauma prevalence, reported poorer physical health, and experienced more mental disorder. Although the findings varied for heroin, females generally had higher levels of substance misuse than men including IDU. Regarding treatment, women more likely received past substance misuse or mental health-related therapy, and expressed higher motivation for same. The findings indicated these variables are possible confounders and so should be controlled in investigations assessing for gender differences in relationships between trauma, substance misuse, and psychological distress associated with trauma. Furthermore, the review's results underlined three critical and interdependent issues for women: trauma, substance misuse, and mental disorder, reinforcing that female offenders have special needs.

Chapter 3 evaluated the TSI-2 developed by Briere (2011). The TSI-2 is a 136-item self-report measure that gauges a wide-range of potentially complex trauma-related symptomatology and behaviours, and was one measure utilised in the quantitative study presented in Chapter 4. Overall, the TSI-2 was found to have good reliability and validity. Nevertheless, there are generalisability issues since it was normed predominantly on educated White Americans; this limits the TSI-2's applicability to different demographics, which is a particular deficit for its use in forensic settings. Given these issues, good practice recommends using complementary measures to ensure a thorough assessment and to lessen bias.

Chapter 4 detailed a quantitative study examining the relationship between trauma and substance misuse, and trauma-related distress, and if there were gender differences with a representative sample of 58 high-risk MDOs detained in hospital with high rates of trauma and substance misuse. With the aim of establishing the particular relationships for women and their distinct needs, it was essential to first determine the links in the entire population, and investigate the influence of moderating variables such as age. Using a homogenous sample comprised of male and female high-risk MDOs restricted variability when contrasting relationships, and in doing so decreased potential confounders like mental disorder.

The research assessed the amount of past trauma, the level and severity of past substance misuse, and current trauma-related symptomatology. The relationship with past trauma and past substance use, and current trauma-related psychological sequelae was explored and examined if the relationships differed by gender. Results revealed participants had been exposed to an average of seven past traumatic events, most had misused substances historically, and high rates of trauma-related stress prevailed with participants typically having three TSI-2 clinically elevated scales; no gender differences were found in these domains. Higher levels of past substance use were related to higher levels of current Self-Disturbance, Posttraumatic Stress, Anxious Arousal, and Anxiety. However, no significant findings were revealed related specifically to Depression. Analysis within genders found that levels of past substance use severity was associated with greater current trauma-related Self-Disturbance, Posttraumatic Stress, Anxious Arousal, and Anxiety for male MDOs only. Again, Depression was not found to be significant.

Chapter 5 presented a qualitative study with a subset of 23 high-risk female MDOs from the quantitative research described in Chapter 4, which undertook a detailed exploration into their views about the relationship between their past traumas and

substance misuse. Rich data was yielded from the face-to-face semi-structured interviews. Thematic analysis uncovered three superordinate themes: (1) substance misuse as self-medication including general coping, emotional constriction, and emotional blocking, (2) substance misuse linked to increased trauma/risk (high-risk hypothesis), and (3) coercion to misuse substances as integral to the trauma.

Clinical Implications

This thesis contributes to the extant evidence base that rates of past trauma, substance misuse, and mental disorder are widespread in offenders, especially females as per the systematic review's findings. This strengthens the idea that women in the offender population have distinct needs. Furthermore, regarding high-risk MDOs, the thesis' findings complements the limited literature, confirming the high prevalence rates of substance misuse in this cohort; it further adds that trauma exposure rates are high for both genders. The use of coercion in substance misuse for females suggests a distinctive treatment need in addressing relationships, and self-efficacy. Moreover, a chief contribution of this thesis derives from the mixed methods approach; by combining statistical generalisation from the quantitative study with theoretical generalisation from the qualitative component through triangulation, enhancing validity, the thesis generated a unique contribution of knowledge and insight for this under-researched population to inform substance misuse treatment interventions.

Although substance misuse has long been recognised as a problem for individuals, families, and society, recovery has been unable to be maintained as trauma-related issues have not been addressed. Clinicians unaware of the high trauma prevalence rates among their patients, and mistakenly believing that talking about past trauma elicits cravings and relapse are the two main contributory factors to this omission (Gielen, Krumeich, Havermans, Smeets, & Jansen, 2014). Exploring this crucial

component will mean the prospects for recovery will be more likely and successful. Nonetheless, trauma symptoms and dependence may converge; for example, opioid withdrawal symptoms can mimic hypervigilance, making it difficult to clinically differentiate the two, which clinicians need to be aware of (Fareed et al., 2013).

Attachment theory contends the aetiology of substance misuse starts with an unmet need, and continues as an attachment alternative to relationships (Fletcher et al., 2015; Höfler & Kooyman, 1996). Research suggests treatment approaches addressing attachment-related issues are the *sine qua non* of effective therapy, including persons who misuse substances (Flores, 2006). While Bowlby (1988) formulated attachment theory as spanning the life course of personality development, attachment studies have concentrated primarily on the child's early years. Given the findings supporting the self-medication hypothesis, it is important to embrace attachment theory more widely, especially when formulating substance misuse interventions for high-risk MDOs, as it provides an effective paradigm for informing therapy and addressing related risks for this population with complex needs.

Moreover, despite gaps in the extant literature, contemporary research also supports treating substance misuse, and attachment and trauma-related issues concurrently (Briere, 2019; Flanagan, Korte, Killeen, & Back, 2016; McCauley et al., 2012). This favoured type of integrated treatment adopting a 'whole-person approach' is patients' preference (Gielen et al., 2016). Although the research base does not include high-risk MDOs, patients in high secure settings are in a position therapy advocates for and that is, abstinence. Although abstinence is imposed because of the high secure environment, patients' detained status can create a therapeutic window of opportunity to begin to address these complex, comorbid problems. Furthermore, akin to innovation with medication associated with vigilant monitoring for side effects,

psychological interventions should be monitored in this process and data from individual cases collated and disseminated to avoid iatrogenic outcomes (Jones, 2019).

Limitations

The thesis is subject to limitations, which have been raised in the appropriate chapters. These are summarised here in closing. The introductory chapter outlined definitional issues, regarding the key concepts of trauma, substance misuse, and mental disorder, reflective of their complexity. It is recognised broader definitions may affect documented prevalence rates in the existing literature.

The main shortcoming of the systematic review, as presented in Chapter 2, was the paucity of research regarding gender differences for drug-using offenders, reflective in the small sample size of 19 included publications. Moreover, the disproportionately high number of male offenders included in the studies, paralleling the criminal justice system's overall position, reduced power, especially for detecting female gender differences. The generalisability of the review's findings may be hindered additionally by its primarily American composition, which may reveal idiosyncratic drug use configurations. Problems with nomenclature were raised, particularly around ambiguously referring to 'hard' and 'soft' drugs, and the concepts of sex and gender. It was assumed the included studies operationalised gender generally, foregoing exploring if substances have distinct sex-related physiological effects.

The thesis evaluated the TSI-2, one of the measures used in Chapter 4's quantitative research. As with the other tests employed in the quantitative study, it is a self-report measure. Although important to research, retrospective self-report questionnaires are subject to biases relating to retention and recall, along with under-reporting together with over-reporting or embellishment, which substance misusing MDOs may be

susceptible to for vindication purposes (Widom et al., 1999). Also, two clinically relevant matters may have impacted participants' ability to reflect on past experiences: (1) perceptive distortions inherent in PD, a diagnosis ubiquitous in the sample, and (2) the effect of therapy given their patient status. It is recommended due regard is paid to these shortcomings when interpreting and accepting the thesis' findings.

Male and female participants' similar levels of past trauma, substance use, and mental disorder contrasts with findings from studies with both general and prison populations, including Chapter 2's systematic review wherein women were found to have higher levels. This data was an unanticipated result; it may be a consequence of the relatively small-sized and homogenous sample. In the context of limited comparable research and the overall heterogeneity of the background literature, these results should be read with caution.

Interpretation of the findings that past Substance Use Severity was correlated with increased current trauma-related Self-Disturbance, Posttraumatic Stress, Anxious Arousal, and Anxiety but not Depression should also be considered within the mixed and scant research base. Further, given the TSI-2's clinical and subscales lack power to differentiate between anxiety and depression related to trauma as standalone measures, these findings may possibly be symptoms of anxiety and depression related to other disorders. The data about the TSI-2 factor scores may be more reliable as they exemplify a constellation of trauma-related symptoms. Moreover, it is important to be cognisant about the statistical limitations multiple testing imposes in terms of the increased risk of a Type I error, and within the context that the Bonferroni correction was not applied. This would have been reduced if either the analyses were restricted to the factor scores, or (M)ANCOVA applied.

Finally, the exploratory analyses conducted separately for the genders revealed that past substance use severity was associated with increased levels of current trauma-related Self-Disturbance, Posttraumatic Stress, Anxious Arousal, and Anxiety for male participants only. Depression was found to not be significant. This may be related to potential confounders previously considered related to age, length of admission, and increased levels of Clusters A and C personality disorders (although there was concordance with Cluster B); hence should be interpreted with care.

Implications for Further Research

The new data provided by this original study suggests that high-risk MDOs are a distinct, homogeneous group with less gender differences discerned vis-à-vis prison populations. Although the standardised sample helped to control for possible confounders, in the context of limited comparable research, it will be important to conduct future studies with larger samples, if viable, to establish if these findings hold. Further research on the individual and placement needs of high-risk MDOs is recommended to understand the effect trauma has on their needs, notably the influence of trauma-related symptoms on the maintenance of substance misuse, which is warranted for both genders (Gielen et al., 2016; Thomas et al., 2005).

Although the current study makes an original contribution to the knowledge base for this population, with some findings informing directions for further study with a challenging and under-researched group, at present the conclusions are speculative and so cannot constitute the basis for clinical service change, especially whilst the area remains nascent. Future research needs to develop the many evidenced-based and promising opportunities for integrating trauma and substance misuse interventions to determine their effectiveness with this specialised population, including ethnic minority MDOs (Dass-Brailsford & Safilian, 2017).

Integrated treatment models for co-occurring PTSD and substance misuse issues have been developed, with CBT approaches showing the most promise, although more research is required to determine the combination of components to include for optimal integration, which is especially germane for MDOs (Dass-Brailsford & Myrick, 2010; Long et al., 2010; McGovern et al., 2009). Furthermore, evidence suggests different trauma types related to substance use as a coping mechanism are important risk factors differentiating women who have experienced trauma and problematic use from those who do not; hence disaggregating trauma types in future research may be important to gain a clearer understanding of the pathways regarding substance misuse and trauma, assisting in the identification of those at greater risk for substance misuse (Ullman et al., 2013).

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APPENDIX 1

PsycINFO Search Strategy

Database: PsycINFO <1806 to September Week 2 2019>

- 1 exp Drug Abuse/ (46993)
- 2 exp Alcohol Abuse/ or exp Alcohol Intoxication/ or exp Alcoholism/ (50063)
- 3 exp Alcoholic Beverages/ (2790)
- 4 exp Cannabis/ or exp Marijuana/ or exp Hashish/ or exp Heroin/ or exp Crack Cocaine/ or exp Cocaine/ or exp Amphetamine/ or exp Methamphetamine/ (34878)
- 5 ("substance*" or "drug*" or "narcotic*").ti,ab. (265116)
- 6 (alcohol* or "problem drink*" or "alcoholic beverage*" or "alcoholic drink*" or booze or liquor or beer* or wine or spirits or drunk* or intoxicat*).ti,ab. (133553)
- 7 ("cannabis" or "marijuana" or "marihuana" or "hash" or "hashish" or "grass" or "dope" or "heroin" or "cocaine" or "crack cocaine" or "crack" or "amphetamine*" or "methamphetamine*" or "crystal meth").ti,ab. (57195)
- 8 or/1-7 (373419)
- 9 exp Violent Crime/ or exp Crime/ or exp Sex Offenses/ or exp Rape/ or exp Pedophilia/ or exp Theft/ or exp Arson/ or exp Criminal Behavior/ or exp Criminals/ or exp Mentally Ill Offenders/ or exp Female Criminals/ or exp Homicide/ or exp Male Criminals/ or exp Recidivism/ or exp Infanticide/ (134594)
- 10 (crime* or criminal* or "criminal behaviour*" or "criminal behavior*" or criminogenic or Felon* or offen* or Delinquen* or unlawful or illegal or reoffend* or re-offend* or recidiv* or homicide or murder* or manslaughter or Infanticide or parricide or "sex offen*" or rape or rapist or "sex* assault*" or pedophil* or paedophil* or burglar* or robber* or theft* or stealing or arson* or "fire-sett*" or "fire sett*" or firesett* or prostitut* or "sex work*" or prison* or parol* or probation*).ti,ab. (151436)
- 11 or/9-10 (210876)
- 12 8 and 11 (34518)
- 13 exp Human Sex Differences/ (110415)
- 14 ("Sex difference*" or "sex-related difference*" or "sex related difference*" or "sex-specific difference*" or "sex specific difference*" or "sex distinction*" or "sex characteristic*" or "sex distribution*" or "sex factor*" or "gender difference*" or "gender-related difference*" or "gender related difference*" or "gender-specific difference*" or "gender specific difference*" or "gender variation*" or "gender distinction*" or "gender characteristic*" or "gender distribution*" or "gender factor*").ti,ab. (56984)
- 15 (((male* or men) and (female* or women)) adj2 difference*).ti,ab. (22361)
- 16 (((male* or men) and (female* or women)) adj2 similar*).ti,ab. (8396)
- 17 (((male* or men) and (female* or women)) adj2 compar*).ti,ab. (20055)

18 or/13-17 (153371)
19 12 and 18 (1958)
20 ((singl* or doubl* or trebl* or tripl*) adj (blind* or mask*)).mp. (25371)
21 (random* adj5 (assign* or allocat*)).mp. (42804)
22 randomi*.mp. (84850)
23 (crossover or cross-over).mp. (9901)
24 (quasi-experiment* or "quasi experiment*" or quasiexperiment* or experiment*
or pre-experiment*).mp. (490097)
25 ("repeated measure*" or "pre-post test*" or pretest-posttest* or pretest* or "pre
test*" or posttest* or "post test*" or "time series").mp. (56480)
26 (clin* adj2 trial).mp. (14669)
27 or/20-26 (636473)
28 19 and 27 (114)
29 limit 28 to (english language and yr="2000 - 2020") (90)

APPENDIX 2

JBI Meta Analysis of Statistics Assessment and Review Instrument (MAStARI) for Experimental Studies*

Reviewer _____ Date _____

Author _____ Year _____ Record Number _____

	Yes	No	Unclear	N/A
1. Is this study a RCT design?				
2. Is this study an experimental design?				
3. Is this study a quasi-experimental design?				
4. Was the assignment to treatment groups truly random?				
5. Were participants blinded to treatment allocation?				
6. Was allocation to treatment groups concealed from the allocator?				
7. Were the outcomes of people who withdrew described and included in the analysis?				
8. Were those assessing the outcomes blind to the treatment allocation?				
9. Were control and treatment groups comparable at entry?				
10. Were groups treated identically other than for the named interventions?				
11. Were outcomes measured in the same way for all groups?				
12. Were outcomes measured in a reliable way?				
13. Was appropriate statistical analysis used?				

Overall appraisal: Include ☐ Exclude ☐ Seek further info ☐

Comments (including reasons for exclusion):

*Adapted from: Joanna Briggs Institute (2014). *Reviewers' manual 2014 edition*. Adelaide, AU: The Joanna Briggs Institute

APPENDIX 3



Health Research Authority

Email: hra.approval@nhs.net

02 December 2016

Dear Professor Glazebrook,

Letter of HRA Approval

Study title:	The Trauma-Informed Substance Misuse Treatment Needs of High-Risk Female Mentally Disordered Offenders
IRAS project ID:	195478
Protocol number:	16080
REC reference:	16/EM/0385
Sponsor:	University of Nottingham

I am pleased to confirm that HRA Approval has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications noted in this letter.

Participation of NHS Organisations in England

The sponsor should now provide a copy of this letter to all participating NHS organisations in England.

Appendix B provides important information for sponsors and participating NHS organisations in England for arranging and confirming capacity and capability. **Please read *Appendix B* carefully**, in particular the following sections:

- *Participating NHS organisations in England* – this clarifies the types of participating organisations in the study and whether or not all organisations will be undertaking the same activities
- *Confirmation of capacity and capability* - this confirms whether or not each type of participating NHS organisation in England is expected to give formal confirmation of capacity and capability. Where formal confirmation is not expected, the section also provides details on the time limit given to participating organisations to opt out of the study, or request additional time, before their participation is assumed.

- *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* - this provides detail on the form of agreement to be used in the study to confirm capacity and capability, where applicable.

Further information on funding, HR processes, and compliance with HRA criteria and standards is also provided.

It is critical that you involve both the research management function (e.g. R&D office) supporting each organisation and the local research team (where there is one) in setting up your study. Contact details and further information about working with the research management function for each organisation can be accessed from www.hra.nhs.uk/hra-approval.

Appendices

The HRA Approval letter contains the following appendices:

- A – List of documents reviewed during HRA assessment
- B – Summary of HRA assessment

After HRA Approval

The document “*After Ethical Review – guidance for sponsors and investigators*”, issued with your REC favourable opinion, gives detailed guidance on reporting expectations for studies, including:

- Registration of research
- Notifying amendments
- Notifying the end of the study

The HRA website also provides guidance on these topics, and is updated in the light of changes in reporting expectations or procedures.

In addition to the guidance in the above, please note the following:

- HRA Approval applies for the duration of your REC favourable opinion, unless otherwise notified in writing by the HRA.
- Substantial amendments should be submitted directly to the Research Ethics Committee, as detailed in the *After Ethical Review* document. Non-substantial amendments should be submitted for review by the HRA using the form provided on the [HRA website](http://www.hra.nhs.uk), and emailed to hra.amendments@nhs.net.
- The HRA will categorise amendments (substantial and non-substantial) and issue confirmation of continued HRA Approval. Further details can be found on the [HRA website](http://www.hra.nhs.uk).

Scope

HRA Approval provides an approval for research involving patients or staff in NHS organisations in England.

If your study involves NHS organisations in other countries in the UK, please contact the relevant national coordinating functions for support and advice. Further information can be found at <http://www.hra.nhs.uk/resources/applying-for-reviews/nhs-hsc-rd-review/>.

If there are participating non-NHS organisations, local agreement should be obtained in accordance with the procedures of the local participating non-NHS organisation.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please email the HRA at hra.approval@nhs.net. Additionally, one of our staff would be happy to call and discuss your experience of HRA Approval.

HRA Training

We are pleased to welcome researchers and research management staff at our training days – see details at <http://www.hra.nhs.uk/hra-training/>

Your IRAS project ID is **195478**. Please quote this on all correspondence.

Yours sincerely,

Emma Stoica
Senior Assessor

Email: hra.approval@nhs.net

Copy to:

Ms Angela Shone, sponsor contact: sponsor@nottingham.ac.uk

Ms Shirley Mitchell, lead NHS R&D contact: shirley.mitchell@nottshc.nhs.uk

Appendix A - List of Documents

The final document set assessed and approved by HRA Approval is listed below.

<i>Document</i>	<i>Version</i>	<i>Date</i>
Copies of advertisement materials for research participants	2	26 October 2016
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only)	2016/17	
GP/consultant information sheets or letters [Letter to Responsible Clinician]	2	26 October 2016
Interview schedules or topic guides for participants [Womens services Participants]	2	26 October 2016
IRAS Application Form [IRAS_Form_22082016]		22 August 2016
Letter from sponsor		
Non-validated questionnaire [Substance use Questionnaire]	2	26 October 2016
Other [Statement of Activities]	1	
Other [Schedule of Event]	1	
Participant consent form	2.1	02 December 2016
Participant information sheet (PIS)	2.1	02 December 2016
Research protocol or project proposal	2	26 October 2016
Summary CV for Chief Investigator (CI)		
Summary CV for student		
Summary CV for supervisor (student research)		
Validated questionnaire [AUDIT]	2	26 October 2016
Validated questionnaire [DAST-20]	2	26 October 2016
Validated questionnaire [TSI-2 Item Booklet]	2	
Validated questionnaire [TSI-2 Answer Sheet]	2	

Appendix B - Summary of HRA Assessment

This appendix provides assurance to you, the sponsor and the NHS in England that the study, as reviewed for HRA Approval, is compliant with relevant standards. It also provides information and clarification, where appropriate, to participating NHS organisations in England to assist in assessing and arranging capacity and capability.

For information on how the sponsor should be working with participating NHS organisations in England, please refer to the, *participating NHS organisations, capacity and capability and Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* sections in this appendix.

The following person is the sponsor contact for the purpose of addressing participating organisation questions relating to the study:

Ms Angela Shone

E-mail: sponsor@nottingham.ac.uk

HRA assessment criteria

Section	HRA Assessment Criteria	Compliant with Standards	Comments
1.1	IRAS application completed correctly	Yes	No comments
2.1	Participant information/consent documents and consent process	Yes	Very minor revisions were made to the Participant Information Sheet and Consent form following REC review, in order to make them compliant with HRA standards.
3.1	Protocol assessment	Yes	No comments
4.1	Allocation of responsibilities and rights are agreed and documented	Yes	A Statement of Activities will act as agreement of the NHS organisation to participate.
4.2	Insurance/indemnity arrangements assessed	Yes	Where applicable, independent contractors (e.g. General Practitioners) should ensure that the professional indemnity provided by their medical defence organisation covers the activities expected of them for this research study.

Section	HRA Assessment Criteria	Compliant with Standards	Comments
4.3	Financial arrangements assessed	Yes	The sponsor will not provide any funding to the participating NHS organisation, as specified in the Statement of Activities.
5.1	Compliance with the Data Protection Act and data security issues assessed	Yes	No comments
5.2	CTIMPS – Arrangements for compliance with the Clinical Trials Regulations assessed	Not Applicable	No comments
5.3	Compliance with any applicable laws or regulations	Yes	No comments
6.1	NHS Research Ethics Committee favourable opinion received for applicable studies	Yes	No comments
6.2	CTIMPS – Clinical Trials Authorisation (CTA) letter received	Not Applicable	No comments
6.3	Devices – MHRA notice of no objection received	Not Applicable	No comments
6.4	Other regulatory approvals and authorisations received	Not Applicable	No comments

Participating NHS Organisations in England

This provides detail on the types of participating NHS organisations in the study and a statement as to whether the activities at all organisations are the same or different.

There is one type of participating NHS organisations in the study, and all research activities, as described in the Statement of Activities and Schedule of Events, will be carried out at one NHS organisation.

The Chief Investigator or sponsor should share relevant study documents with participating NHS organisations in England in order to put arrangements in place to deliver the study. The documents should be sent to both the local study team, where applicable, and the office providing the research management function at the participating organisation. For NIHR CRN Portfolio studies, the Local LCRN contact should also be copied into this correspondence. For further guidance on working with participating NHS organisations please see the HRA website.

If chief investigators, sponsors or principal investigators are asked to complete site level forms for participating NHS organisations in England which are not provided in IRAS or on the HRA website, the chief investigator, sponsor or principal investigator should notify the HRA immediately at hra.approval@nhs.net. The HRA will work with these organisations to achieve a consistent approach to information provision.

Confirmation of Capacity and Capability

This describes whether formal confirmation of capacity and capability is expected from participating NHS organisations in England.

The participating NHS organisation in England **will be expected to formally confirm their capacity and capability to host this research.**

- Following issue of this letter, participating NHS organisations in England may now confirm to the sponsor their capacity and capability to host this research, when ready to do so. How capacity and capability will be confirmed is detailed in the *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* section of this appendix.
- The [Assessing, Arranging, and Confirming](#) document on the HRA website provides further information for the sponsor and NHS organisations on assessing, arranging and confirming capacity and capability.

Principal Investigator Suitability

This confirms whether the sponsor position on whether a PI, LC or neither should be in place is correct for each type of participating NHS organisation in England and the minimum expectations for education, training and experience that PIs should meet (where applicable).

A Principal Investigator is required for this type of study. The PI has been identified.

GCP training is not a generic training expectation, in line with the [HRA statement on training expectations](#).

HR Good Practice Resource Pack Expectations

This confirms the HR Good Practice Resource Pack expectations for the study and the pre-engagement checks that should and should not be undertaken

The activities at the participating NHS organization will be undertaken by staff who have adequate contractual relationship with the host organization, therefore no additional arrangements (honorary research contracts or letters of access) are expected for this study.

Other Information to Aid Study Set-up

This details any other information that may be helpful to sponsors and participating NHS organisations in England to aid study set-up.

The applicant has indicated that they do not intend to apply for inclusion on the NIHR CRN Portfolio.

APPENDIX 4

CONSENT FORM (Final Version 2.1: 02.12.16)

Title of Study: The Relationship Between Trauma and Substance Misuse

REC ref: 16/EM/0385; IRAS ID: 195478

Name of Researcher: Elaine Fehrman

Name of Participant: _____

Please initial box

1. I confirm that I have read and understand the Participant Information Sheet (Final Version 2.1) dated 02.12.16 for the above study and have had the opportunity to ask questions. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without my medical care or legal rights being affected. I understand that should I withdraw then the information collected so far cannot be erased and that this information may still be used in the project analysis. ☐
3. Although what I say during interview is confidential, if anything is disclosed which puts me or anyone else at any risk, including the security of the Hospital, there is a legal obligation to report this. ☐
4. I understand that relevant sections of my medical notes and data collected in the study may be looked at by authorised individuals from the University of Nottingham, the research group and regulatory authorities where it is relevant to my taking part in this study. I give permission for these individuals to have access to these records and to collect, store, analyse and publish information obtained from my participation in this study. I understand that my personal details will be kept confidential. ☐
5. I understand that the interview will be recorded and that anonymous direct quotes from the interview may be used in the study reports. ☐
6. I agree to take part in the above study. ☐

Name of Participant

Date

Signature

Name of Person taking consent

Date

Signature

3 copies: 1 for participant, 1 for the project notes, and 1 for the medical notes

APPENDIX 5

LEC-5

Listed below are a number of difficult or stressful things that sometimes happen to people. For each event check one or more of the boxes to the right to indicate that: (a) it happened to you personally; (b) you witnessed it happen to someone else; (c) you learned about it happening to a close family member or close friend; (d) you were exposed to it as part of your job (for example, paramedic, police, military, or other first responder); (e) you're not sure if it fits; or (f) it doesn't apply to you.

Be sure to consider your entire life (growing up as well as adulthood) as you go through the list of events.

Event	Happened to me	Witnessed it	Learned about it	Part of my job	Not Sure	Doesn't Apply
1. Natural disaster (for example, flood, hurricane, tornado, earthquake)						
2. Fire or explosion						
3. Transportation accident (for example, car accident, boat accident, train wreck, plane crash)						
4. Serious accident at work, home, or during recreational activity						
5. Exposure to toxic substance (for example, dangerous chemicals, radiation)						
6. Physical assault (for example, being attacked, hit, slapped, kicked, beaten up)						
7. Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb)						
8. Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)						
9. Other unwanted or uncomfortable sexual experience						
10. Combat or exposure to a war-zone (in the military or as a civilian)						
11. Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war)						
12. Life-threatening illness or injury						
13. Severe human suffering						
14. Sudden violent death (for example, homicide, suicide)						
15. Sudden accidental death						
16. Serious injury, harm, or death you caused to someone else						
17. Any other very stressful event or experience						

LEC-5 (10/27/2013) Weathers, Blake, Schnurr, Kaloupek, Marx, & Keane -- National Center for PTSD

APPENDIX 6

PARTICIPANT ID: _____

DATE: _____

DRUG USE QUESTIONNAIRE (DAST-20)*

The following questions concern information about your potential involvement with drugs not including alcoholic beverages during the 12 months before your index offence.

Carefully read each statement and decide if your answer is "Yes" or "No". Then, circle the appropriate response beside the question. In the statements "drug abuse" refers to (1) the use of prescribed or over the counter drugs in excess of the directions and (2) any non-medical use of drugs. The various classes of drugs may include: cannabis (marijuana, hash), solvents, tranquillisers (e.g. Valium), barbiturates, cocaine, stimulants (e.g. speed), hallucinogens (e.g. LSD) or narcotics (e.g. heroin). Remember that the questions **do not** include alcoholic beverages.

Please answer every question. If you have difficulty with a statement, then choose the response that is mostly right.

Adult Version

<u>These questions refer to the 12 months before the index offence.</u>	<u>Circle your response</u>	
1. Have you used drugs other than those required for medical reasons?	Yes	No
2. Have you abused prescription drugs?	Yes	No
3. Do you abuse more than one drug at a time?	Yes	No
4. Can you get through the week without using drugs?	Yes	No
5. Are you always able to stop using drugs when you want to?	Yes	No
6. Have you had "blackouts" or "flashbacks" as a result of drug use?	Yes	No
7. Do you ever feel bad or guilty about your drug use?	Yes	No
8. Does your spouse (or parents) ever complain about your involvement with drugs?	Yes	No
9. Has drug abuse created problems between you or your spouse or your parents?	Yes	No
10. Have you lost friends because of your use of drugs?	Yes	No
11. Have you neglected your family because of your use of drugs?	Yes	No
12. Have you been in trouble at work (or school) because of drug abuse?	Yes	No
13. Have you lost your job because of drug abuse?	Yes	No
14. Have you gotten into fights when under the influence of drugs?	Yes	No
15. Have you engaged in illegal activities in order to obtain drugs?	Yes	No
16. Have you been arrested for possession of illegal drugs?	Yes	No
17. Have you ever experienced withdrawal symptoms (felt sick) when you stopped taking drugs?	Yes	No
18. Have you had medical problems as a result of your drug use (e.g. memory loss, hepatitis, convulsions, bleeding, etc.)?	Yes	No
19. Have you gone to anyone for help for drug problems?	Yes	No
20. Have you been involved in a treatment programme specifically related to drug use?	Yes	No

APPENDIX 7

PARTICIPANT ID: _____

DATE: _____

AUDIT*

The Alcohol Use Disorders Identification Test (AUDIT), developed in 1982 by the World Health Organization, is a simple way to screen and identify people at risk of alcohol problems.

Please answer the following questions based on the time period right before your index offence.

1. Before the index offence, how often would you have a drink containing alcohol?

- (0) Never (Skip to Questions 9-10)
- (1) Monthly or less
- (2) 2 to 4 times a month
- (3) 2 to 3 times a week
- (4) 4 or more times a week

2. How many drinks containing alcohol would you have on a typical day when you are drinking?

- (0) 1 or 2
- (1) 3 or 4
- (2) 5 or 6
- (3) 7, 8, or 9
- (4) 10 or more

3. How often would you have six or more drinks on one occasion?

- (0) Never
- (1) Less than monthly
- (2) Monthly
- (3) Weekly
- (4) Daily or almost daily

4. How often during the last year before the index offence would you find that you were not able to stop drinking once you had started?

- (0) Never
- (1) Less than monthly
- (2) Monthly
- (3) Weekly
- (4) Daily or almost daily

5. How often during the last year before the index offence did you fail to do what was normally expected from you because of drinking?

- (0) Never
- (1) Less than monthly
- (2) Monthly
- (3) Weekly
- (4) Daily or almost daily

*Adapted for use in secure hospital.

6. How often during the last year before the index offence were you unable to remember what happened the night before because you had been drinking?

- (0) Never
- (1) Less than monthly
- (2) Monthly
- (3) Weekly
- (4) Daily or almost daily

7. How often during the last year before the index offence did you need an alcoholic drink first thing in the morning to get yourself going after a night of heavy drinking?

- (0) Never
- (1) Less than monthly
- (2) Monthly
- (3) Weekly
- (4) Daily or almost daily

8. How often during the last year before the index offence did you have a feeling of guilt or remorse after drinking?

- (0) Never
- (1) Less than monthly
- (2) Monthly
- (3) Weekly
- (4) Daily or almost daily

9. Have you or someone else ever been injured as a result of your drinking?

- (0) No
- (2) Yes, but not in the last year before the index offence
- (4) Yes, during the last year before the index offence

10. Has a relative, friend, doctor, or another health professional expressed concern about your drinking or suggested you cut down?

- (0) No
- (2) Yes, but not in the last year before the index offence
- (4) Yes, during the last year before the index offence

Add up the points associated with answers. A total score of 8 or more indicates harmful drinking behaviour.

APPENDIX 8

SUBSTANCE USE QUESTIONNAIRE (Final Version 2.0: 26.10.16)

Title of Study: The Relationship Between Trauma and Substance Misuse

REC ref: 16/EM/0385

Name of Researcher: Elaine Fehrman

Participant ID:

Below is a list of substances you may have used. Place a tick (✓) by those you have ever used:

1. Alcohol	
2. Amyl nitrite	
3. Amphetamine	
4. Benzodiazepines (minor tranquillisers)	
5. Cannabis	
6. Cocaine powder	
7. Crack cocaine	
8. Ecstasy (MDMA)	
9. GHB	
10. Heroin	
11. Ketamine	
12. Khat	
13. Legal highs	
14. LSD	
15. Magic mushrooms	
16. Methadone	

17. Solvents/inhalants	
18. Steroids	
19. Tobacco	
20. 2-CB	

Any others? Please list below:

.....

.....

.....

Many thanks for taking the time to complete this questionnaire.

APPENDIX 9

Participant Information Sheet

(Final Version 2.1: 02.12.16)

Title of Study: The Relationship Between Trauma and Substance Misuse

Name of Researcher: Elaine Fehrman

We would like to invite you to take part in our research study, which Elaine is doing as part of her Doctoral training in Forensic Psychology. Before you decide, we would like you to understand why the research is being done and what it would involve for you. Elaine will go through the information sheet with you and answer any questions you have. Please ask if there is anything that is not clear.

What is the purpose of the study?

The project is taking place because at the moment little is known about how trauma (the experience of a very distressing event) affects patients in high secure care who have used substances (drugs and alcohol) in the past, and if there are differences for men and women. We would like to know more about this so substance misuse treatment at [REDACTED] the specific needs of patients. So far, substance misuse treatment [REDACTED] and other secure hospitals has been developed only for men. The Women's Service has not had a substance misuse programme for many years. Participating in the project will help us to improve substance misuse treatment for men, and also develop a useful and beneficial programme for women.

Why have I been invited?

We are looking to include patients in the Men's Personality Disorder (PD) and National Women's Directorate. Your Responsible Clinician (RC) had identified you as someone who might be eligible for the study. Or, it may be the case that you volunteered following your ward's community meeting where the study was talked about. It is hoped that at least 40 patients in the Directorate will take part.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason. This would not affect your future care, treatment, or legal rights.

What will happen to me if I take part?

Consent

Once you have agreed a time to meet Elaine, you will be asked to sign a consent form before you participate. Participating in the study is totally voluntary, and you can change your mind at any time without giving a reason.

Questionnaires / interview

All participants will be asked to complete up to five tick-box questionnaires, which will include questions about your experiences relating to trauma, questions about any past substance use, and questions about your current mental health. These questions will take up to 45 minutes to complete. The questionnaires can usually be completed in one session. During the session it will be possible to take a break, if you like. You can read the questions yourself or Elaine can read the questions to you.

In addition, if you are in the Women's Services, you will be asked to take part in an interview to explore your experiences in more depth, including your views on substance misuse treatment. In order to make sure Elaine takes down all the information you tell her, she would like to record this interview using a little handheld voice recorder. The recording will be written up (transcribed) by Elaine only, in order to maintain your privacy and confidentiality. The audio recording will be anonymised and securely stored. Your name will not appear on the notes so nobody apart from Elaine will be able to identify you. If any direct quotes are taken from our interview, you will not be referenced so nobody will know what you said.

Files

Elaine will also need some information from your records related to demographic information. For example, your Mental Health Act (1983/2007) Section, diagnosis, and index offence. This information will be stored securely with the other information you provide.

Expenses and payments

You will not be paid to participate in the study.

What are the possible disadvantages and risks of taking part?

Answering questions about your experiences of trauma, substance misuse, offending, and mental health problems could bring back some unpleasant memories for you. What you share during interviews will be kept confidential; your nursing team will provide you with any necessary support.

What are the possible benefits of taking part?

We cannot promise the study will help you but the information we get from this study may help other patients who participate in substance misuse treatment. Taking part may also give you some insight regarding your own experiences and treatment needs.

What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the researcher (Elaine Fehrman) who will do her best to answer your questions. If Elaine is unable to help you, her University Supervisor, Professor Cris Glazebrook, can also be contacted using the details provided at the end of this information sheet. Or, you can always speak to your named nurse or RC. If you remain unhappy and wish to complain formally, you can do this by contacting Patients' Advocacy or the Service Liaison Department; their details are noted at the end of the information sheet.

Will my taking part in the study be kept confidential?

Although what you say in the interview is confidential, should you disclose anything to Elaine which puts you or anyone else at any risk, including the security of the Hospital, it may be necessary to report this to the appropriate persons.

If you join the study, some parts of your medical records and the data collected for the study will be looked at by authorised persons from the University of Nottingham who are organising the research. They may also be looked at by authorised people to check that the study is being carried out correctly. All will have a duty of confidentiality to you as a research participant and we will do our best to meet this duty.

All information which is collected about you during the course of the research will be kept **strictly confidential**, stored securely in a locked cabinet in a locked office at [REDACTED] and on a password protected database. Your name will not appear on this database or on any questionnaires that you have completed. Any information about you which leaves the Hospital will have your name and identifying details removed (anonymised) and a unique code will be used so that you cannot be recognised from it.

Your personal data will be kept for six to 12 months after the end of the study so that we are able to contact you about the findings of the study (unless you advise us that you do not wish to be contacted). All other data (research data) will be kept securely for seven years. After this time your data will be disposed of securely. During this time all precautions will be taken by all those involved to maintain your confidentiality; only members of the research team will have access to your personal data.

What will happen if I don't want to carry on with the study?

Your participation is voluntary and you are free to withdraw at any time, without giving any reason, and without your legal rights being affected. If you withdraw then the information collected so far cannot be erased and this information may still be used in the project analysis.

What will happen to the results of the research study?

A summary of the results of the project will be available once the study has finished. Elaine will provide an information leaflet to everyone who has taken part. If participants choose, the results can also be shared at patient-led meetings such as ward community meetings. The results will also be written up by Elaine as part of meeting the requirements of the Doctorate in Forensic Psychology.

Who is organising and funding the research?

This research is being organised by the University of Nottingham and is supported by [REDACTED]
[REDACTED] The research is not receiving any funding.

Who has reviewed the study?

All research in the NHS is looked at by independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and given favourable opinion by the East Midlands – Leicester Central Research Ethics Committee.

Further information and contact details:

Elaine Fehrman
Advanced Practitioner

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Professor Cris Glazebrook
Head of Division of Psychiatry and Applied Psychology

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Making a complaint:

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

APPENDIX 10

INTERVIEW SCHEDULE: WOMEN'S SERVICES PARTICIPANTS (Final Version 2.0: 26.10.16)

Title of Study: The Relationship Between Trauma and Substance Misuse

REC ref: 16/EM/0385; **IRAS ID:** 195478

Name of Researcher: Elaine Fehrman

Participant ID:

Date:

The study I'm doing is trying to explore the relationship between trauma and substance use. This interview is about you and your perspective about the link between trauma and substance use. I would also like to hear your views on substance misuse treatment. This will hopefully help develop an effective substance misuse treatment programme for Women's Services.

Take your time answering the questions. You don't have to answer a question if you don't want to. I am going to record the interview but your personal details will not appear anywhere on the recording or on the written summary.

Do you have any questions before we start?

PART A

I'd like to begin by asking you a few questions about your experiences of trauma...

- 1) I noticed on the LEC-5 you completed that you had experienced [state trauma type(s)]. (If more than one trauma recorded, ask participant if they would like to talk about the most significant traumatic event.)
 - a. Can you tell me a bit about this please?
 - b. How long ago did it happen?
 - c. Were you using drugs/alcohol at the time?
 - d. Did you tell anybody about the trauma? Did they believe you?
 - e. What was the outcome?
- 2) How did this trauma affect you at the time?
 - a. How did you try to manage these effects? (support from friends, family, doctors, psychologists, etc.)?
 - b. Was this helpful?
 - c. What other strategies did you use to manage the emotional impact of the trauma?
 - d. How did the trauma impact on your substance use?
 - e. (If applicable) How did this compare to your experience of other traumatic events you have experienced; do you feel what we have just discussed is typical of the way you responded?
 - f. How does that traumatic event affect you now?

PART B

I would now like to ask you some questions about your experiences and views on substance misuse treatment...

1) Have you received any substance misuse treatment in the past?

If yes:

- a. What sort of treatment was it (individual/group; inpatient/outpatient)?
- b. How long was it?
- c. What topics did it cover?
- d. Setting (inpatient/outpatient, secure hospital, prison, etc.)?
- e. How did it address past trauma?
- f. What were its strengths/strongpoints?
- g. What were its weaknesses/problems?
- h. Was there anything that made the treatment difficult for you?
- i. How could the programme have been improved?
- j. Is there anything that you would have liked to have seen included?

If no,

- a. Was there a reason for this (too unwell, not offered, refused)?

2) What do you think would be helpful to include in a substance misuse treatment programme?

- a. Motivational issues?
- b. Psychoeducation?
- c. Relationship to mental health?
- d. Relationship to offending?
- e. Trauma exposure?

3) Any other views on what would make a good substance misuse treatment programme?

- a. Length/duration of programme?
- b. Length/duration of sessions?
- c. Facilitator – gender, skills, experience, qualities?
- d. Off ward?

General prompts:

Why?

How?

Can you tell me more about that?

Can you say/describe that a little bit more?

How did you feel about that?

What do you mean by...?

Thank you for your time.

APPENDIX 11

Consolidated Criteria for Reporting Qualitative Studies (COREQ): 32-item Checklist

Developed from:

Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*, 19, 349-357. DOI: 10.1093/intqhc/mzm042

You must provide a response for all items. Enter N/A if not applicable.

Item #	Guide questions/description	Reported
Domain 1: Research Team and Reflexivity		
<i>Personal Characteristics</i>		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	✓
2. Credentials	What were the researcher's credentials? e.g. PhD, MD.	✓
3. Occupation	What was their occupation at the time of the study?	✓
4. Gender	Was the researcher male or female?	✓
5. Experience and training	What experience or training did the researcher have?	✓
<i>Relationship with Participants</i>		
6. Relationship established	Was a relationship established prior to study commencement?	✓
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research.	✓
8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. bias, assumptions, reasons and interests in the research topic.	✓
Domain 2: Study Design		
<i>Theoretical Framework</i>		
9. Methodological orientation and theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis.	✓

<i>Participant Selection</i>		
10. Sampling	How were participants selected? E.g. purposive, convenience, consecutive, snowball.	✓
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email.	✓
12. Sample size	How many participants were in the study?	✓
13. Non-participation	How many people refused to participate or dropped out? Reasons?	✓
<i>Setting</i>		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace.	✓
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	✓
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date.	✓
<i>Data Collection</i>		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	✓ (not piloted)
18. Repeat interviews	Were repeat interviews carried out? If yes, how many?	N/A
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	✓
20. Field notes	Were field notes made during/ after the interview or focus groups?	✓
21. Duration	What was the duration of the interviews or focus groups?	✓
22. Data saturation	Was data saturation discussed?	✓
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	N/A
Domain 3: Analysis and Findings		
<i>Data Analysis</i>		

24. Number of data coders	How many data coders collected the data?	✓
25. Description of the coding tree	Did authors provide a description of the coding tree?	✓
26. Derivation of themes	Were themes identified in advance or derived from the data?	✓
27. Software	What software, if applicable, was used to manage the data?	N/A
28. Participant checking	Did participants provide feedback on the findings?	N/A
<i>Reporting</i>		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number.	✓
30. Data and findings consistent	Was there consistency between the data presented and the findings?	✓
31. Clarity of major themes	Were major themes clearly presented in the findings?	✓
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	✓